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HOUSE OF REPRESENTATIVES, UNITED STATES

HEARINGS

BEFORE THE

COMMITTEE ON AGRICULTURE

DURING THE

THIRD SESSION OF THE SIXTY-FIRST CONGRESS

ON THE

ESTIMATES OF APPROPRIATIONS

FOR THE FISCAL YEAR ENDING
JUNE 30, 1912

AND ON OTHER

BILLS AND RESOLUTIONS

SIXTY-FIRST CONGRESS
THIRD SESSION

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AGRICULTURAL APPROPRIATION BILL.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Wednesday, December 7, 1910.

The committee met at 10.20 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

The CHAIRMAN. Gentlemen, in calling the committee together at the beginning of this short session, under the shadow of the returns from the recent election, I am reminded somehow of the story that when the gladiators of ancient Rome entered the arena for their last combat they lifted up their voices and cried out to the assembled spectators, "We, who are about to die, salute you." [Laughter.] I trust you have all had a pleasant summer, and I am heartily glad to welcome you back to the work that remains for us to do. To those of you whose commissions have been renewed and who are looking forward to two more years of service here, I tender my most cordial congratulations. To represent 200,000 people in the Congress of the United States is a high privilege, and it is a great honor when the duties which it imposes are performed with the industry, ability, and single-hearted devotion to the public good which I know characterize the services of the members of this committee.

As to those who, like myself, are entering upon the last period of their services here, I do not know but I may offer congratulations to them also. It seems to me I remember that one of our poets said somewhere, "To every man upon this earth death cometh soon or late." The fate which has befallen us who retire on the 4th of next March is that which, sooner or later, will overtake each of you. My best wish for you is that while you remain your work here may be pleasant to yourselves and useful to your country and that when the time comes for you to join that innumerable caravan that has preceded you into the pale realms of private life you may go with the consciousness of duty well done, with no regrets, and with little reluctance.

Plato tells us that when Socrates came to die, after having spent his last day in pleasant communion with his friends, in bidding them good-by, as he went with the executioner to take the hemlock, he said: "And so we go our way, you to live and I to die. Which is better, Heaven knows."

The clerk will call the roll. [Laughter and applause.]

Mr. RUCKER. Mr. Chairman, one minute, please. I have not been commissioned to speak for my colleagues, but, speaking for myself and, I believe, with the hearty approval of every member of this committee, I desire to say just a few words.

Your remarks, Mr. Scott, remind us that soon or late—some time—friends must separate, the circle will be broken, all earthly ties must be severed. We rejoice, however, in the fact that friendships are

abiding, and that mere separation can not destroy the high regard, lofty esteem, and personal affection which are the natural offspring of long association, intimate acquaintance, and close relations with really good men.

As a partisan, I rejoice in the victory of my party at the last election. But having carefully observed your course for years, appreciated your uniform courtesy to all, valued your distinguished abilities, and admired your unselfish, fearless, and patriotic fidelity to duty, as you saw it, I am pleased to testify that nothing less than a return to the safe and sane methods of democracy would compensate the country for the loss of your public services.

Let me assure you, sir, that when your legislative career shall have ended we will part as friends, and to whatever new activities you may devote your energies and your labors, wherever you may go, we the members of this committee, over which you have so long presided with such conspicuous ability, fairness, and success, in common with all your colleagues, wish you continued health, happiness, and prosperity. [Applause.]

The CHAIRMAN. The committee will now proceed with the consideration of the estimates which appear in the books that are before you, taking up these estimates in their regular order. I have asked Dr. Moore, Chief of the Weather Bureau, to come before us this morning.

STATEMENT OF WILLIS L. MOORE, ESQ., CHIEF OF THE WEATHER BUREAU, DEPARTMENT OF AGRICULTURE, ACCOMPANIED BY MR. A. ZAPPONE AND MR. EDGAR B. CALVERT.

The CHAIRMAN. We wish principally, of course, to consult with you in regard to the details of these estimates. We wish to hear you especially, touching any increases that the estimates may show; but if you would prefer to make a general statement in relation to the year's work of your bureau before taking up the details of the bill, we should be glad to hear you.

Mr. MOORE. Mr. Chairman, our work has moved along in somewhat a routine way during the past year. As you know, we do not do much research work. We only have one station that is especially devoted to research work, so that there is little that is new that I can report in regard to the year's work. We have had a number of destructive hurricanes—three or four since I was here last year—and with the aid of the West India stations that the committee established in 1898 we have succeeded in giving forewarning of the approach of all those big hurricanes. Now, it is possible, and highly probable, that with the best provision that this committee can make for the establishing of stations to the southeast of our continent there will come a time when some West India hurricane of only 100 or 200 miles in diameter will slip between those stations without showing any effect on the barometers of the stations on each side and will hit our coast line with disastrous results. When that time comes you will hear the Weather Bureau abused roundly all over the country, and all its virtues will be forgotten. I just say this because it is not possible with any expenditure of money on the part of this committee or of the Congress, or with the aid of the best scientific talent the world can produce for us to forecast the weather

with anything like absolute certainty or to reduce it down to a mathematical formula, as you can the culmination of some astronomical event. But for all that, the several hurricanes of last fall and those of the past late summer and fall have been successfully forecast.

I will give you a description of one that recently passed over Florida in October. That storm came up over Cuba or passed a little to the west of Cuba. The center seemed to pass right over Key West and came up over the whole peninsula of Florida. The damage was great, but there was little or no loss of life.

I have editorial commendations from practically every important newspaper from New Orleans to Norfolk on the great saving of life and property that resulted from the forewarning of this October hurricane of which I speak, and which was only a sample of what occurred with regard to all of the others. The people constructing railroads in Florida, again, in unsolicited communications testified to their appreciation of the fact that they had been able to move several thousand men from the reefs and low-lying islands who would have been swept away without their having sufficient time to move them had they not received the warning. That is one of the utilities of the work for which you are appropriating—the protection of our southeast coast, our Gulf and south Atlantic coast from the ravages of these western hurricanes.

In our flood service, there have been no important floods during the past year. Such as have occurred have been pretty accurately forecast.

In our work at Mount Weather—our research institution—our final building has been completed and is now occupied. We are making ascensions there nearly every day in the year. We only missed nine days last year in getting flights of considerable altitude.

We have inaugurated one line of research that is separate from Mount Weather, in which you will probably be interested. We have taken, in cooperation with the Forest Service, two water sheds in southwest Colorado, in the Rio Grande Forest Reservation—two water sheds of almost identically the same area. With a detail from the Forestry Service and a detail of two meteorologists from the Weather Bureau, we are jointly putting in there a gauging apparatus for measuring the run-off of those two forested valleys which, as I have said, have practically the same area. We are measuring the snow-fall and the rainfall in detail all over these two sheds. We propose for the first ten years to get an accurate measurement of the precipitation and the run-off, and measure all of the water that does run off accurately. Then it is the intention, after the expiration of that time, to clear one of the valleys—cut away the forests entirely, and continue the measurements of the precipitation and the run-off again for a considerable period, with a view of getting data that will better determine matters with regard to the effect of forests on stream flow that are mooted to-day, and are subjects of quite radical differences of opinion, although the inquiry probably can not give results that will be comparable with what occurs in the Appalachian Range, where the rainfall is heavy; this inquiry in a subarid region will be no criterion for a humid region.

The CHAIRMAN. Where is that area?

Mr. MOORE. In Colorado.

The CHAIRMAN. What part of Colorado?

Mr. MOORE. It is the Rio Grande Forest Reserve in southwest Colorado.

Mr. LEVER. Is it a mountain area?

Mr. MOORE. There are two valleys, and fortunately for our purposes they are practically of equal areas.

Mr. LAMB. How much surface are you going to cut off?

Mr. MOORE. That I can not give you. We have that data in our office, but I have it not here with me.

The CHAIRMAN. The mountains in that region are precipitous and rocky. Do you think the data obtained from the experiments that you have in mind would be in any way comparable with similar data obtained by similar experiments in the Appalachians?

Mr. MOORE. Well, it would be hard to answer that offhand. These two areas are heavily wooded or, of course, they would not have been selected, but the conditions there will not compare with what will be found in the Appalachians.

The CHAIRMAN. The difference which I would have in mind is that on account of the higher altitude of the Rockies and the less rainfall, particularly during the summer time, the reforestation would be nothing like so rapid; and, also, there would not be left after the merchantable trees were cut away anything like the undergrowth and the natural forest cover that is left in the southern mountains after lumbering operations.

Mr. MOORE. It is true that the annual rainfall will be markedly less there than in the East, and it might be advisable to duplicate the experiments somewhere in the East, if we could find two regions that would furnish ideal conditions. I think it will be more largely a problem of the snowfall, you see, than it will be of the rainfall, and I must say the chairman has expressed a thought that should be considered with regard to this line of inquiry.

Mr. HAWLEY. What service selected these two forests?

Mr. MOORE. The Forestry Service proposed them, and, in fact, they had begun to inaugurate a line of inquiry; and when I suggested that such a line of inquiry was meteorological largely and must be either done by the Weather Bureau or in cooperation with it, they agreed to that, and the Secretary approved of my position. In fact, I am of the opinion that there is no necessity for any line of meteorological work in the various bureaus of the department or other bureaus of the Government that should not specifically come under the Weather Bureau. That is what you created the Weather Bureau for, and there is no disagreement in regard to this in the Department of Agriculture. It is well agreed to.

The CHAIRMAN. Nobody anticipates that the taking out or the cutting away of the very limited area that you propose will make any difference in the rainfall or the snowfall of that region?

Mr. MOORE. No; none whatever.

The CHAIRMAN. I can conceive how the moisture might be condensed over a great forest in hot weather, when the forest, on account of its evaporation, might produce a stream of cool air, but on the Rocky Mountains, where there is practically no rainfall in the summer and where the water they get comes in the form of snow in the winter time, it would certainly seem as if it would not take any long series of experiments to determine the fact that there would be just as much snowfall whether the forest was there or not.

Mr. MOORE. Mr. Chairman, there is practically no dispute any longer either between the forestry people or myself or the meteorologists in regard to that problem. It is pretty well recognized by the forestry advocates that the forests do not appreciably change the precipitation; and if the forests do, as we know, slightly lower the heat of summer, and by so lowering the heat of summer bring the temperature of that air down a little closer to the dew point, it has no effect upon the rainfall, because it never does bring the temperature of the lower air down to the point of condensation. If you will go out during a rainfall and make a hydrometric observation, you will not find on an average of probably one time in a thousand that, even during rainfall, has the lower air, where the change of temperature has been produced, fallen to the point of condensation. In other words, gentlemen, inequalities of the temperature are produced by variation in the vegetable cover, but that variation occurs only in the lower stratum, down near the forest, while condensation begins above. Thus the lower stratum of air is not saturated and does not produce condensation. Therefore whatever change in temperature that is effected by the forest occurs in the lower stratum, in which condensation does not occur. Therefore the effect of the forest is inappreciable as a producer of rain or snow.

The CHAIRMAN. Then just what do you expect to determine?

Mr. MOORE. We expect to determine the difference in run-off in a semiarid region. We expect to determine whether or not the forest exercises a more economical employment of a given rain or snow fall than the open area in the region. That is what we expect to show, but I must say that it will be necessary for us to make the same experiment in the Appalachians or in the White Mountains, where the rainfall is heavy, as well as in the Rocky Mountains, before it will be safe to make deductions as to the effect of forests on run-off.

Mr. LAMB. I could save you a lot of trouble if you would come to see me. I would take you up the James River as far as Lynchburg—

Mr. MOORE. Captain, a mere description from memory of any region would not settle this scientific problem. We have to work on it day in and day out for years. Individual recollection would not go very far.

Mr. PLUMLEY. Let me ask you to consider this, also: Where the data is far enough extended both ways you are getting important specific results as to the effect upon the valleys.

Mr. MOORE. Yes.

Mr. PLUMLEY. What we are largely interested in, in the East, is the specific effect upon the mountain, clad or unclad with forests.

Mr. MOORE. Yes.

Mr. PLUMLEY. And there I suggest the thought whether on the pinnacles of mountains you do get up high enough to be up in the air to the point of condensation, and whether the rocks, unclad, do not dissipate and drive away the clouds and burn up the moisture. I am suggesting that. I am not asking the question. I am suggesting that as part of your inquiry. That is our thought.

Mr. MOORE. I can answer that, and say that there is no question at all but that the mountain tops and ridges do cause condensation;

that the impinging of the winds upon these mountain tops may condense rain. We see it very markedly in our rain records, that these mountain tops do create condensation without regard to whether they are forested or unforested. But the problem is one that I think we are undertaking and approaching in the proper way and with the proper spirit. It is one that should be investigated and not dogmatically decided off-hand. It is not a matter that can be settled by what we wish, or by any preconceived theory.

Mr. HAWLEY. What is the nature of the forest in this region that you say is heavily wooded? Is it a pine forest?

Mr. MOORE. I do not know. I have not been there.

Mr. HAWLEY. Has it any undergrowth—any small trees or bushes?

Mr. MOORE. I could not answer at all about that.

Mr. HAWLEY. What about the undergrowth? Is it heavy, or is it mostly thin?

Mr. MOORE. Well, I have not visited the region. I have sent Prof. Frankenfield, one of my assistants, who has made a careful survey, and who has pronounced it satisfactory for our purposes. He has taken charge of the details of the work.

The CHAIRMAN. In a general way I can answer the question of Mr. Hawley, and I will do it briefly, because, of course, we do not want to protract this discussion. All of the Rocky Mountain regions with which I am familiar, in Colorado—and that comprises a considerable portion of it—where forested at all, is forested with pines in the lower altitudes, and spruce and fir in the upper altitudes. There is practically none of the undergrowth in the way of bushes and shrubs that we have in the southern latitudes and in the lower altitudes. The only undergrowth there is the young trees, and the only soil there, practically, is the bed of pine needles and spruce needles, formed there in preceding years; so that when a fire passes over that country (at least as I have seen it) it burns everything down to the rock, and there is not any soil left. It is the difference in the undergrowth and the difference in the nature of the soil, as well as the difference both as to the quantity and time of the rainfall, which prompted my suggestion to Dr. Moore that before he could get data that would be of any value as applied to the eastern and southern mountains he would have to carry on his experiments there. Is there anything further that you wanted to present in a general way?

Mr. MOORE. No; there is nothing further, Mr. Chairman.

The CHAIRMAN. Suppose we turn, then, to the estimates of your bureau. Running down the statutory list, on page 7, we notice the first one: "Chief of division (by transfer from lump fund for general expenses, station salaries), \$2,750." How long has that chief of division been employed on the lump fund?

Mr. MOORE. Oh, several years. I can not give you the exact time; four or five years, I would say.

The CHAIRMAN. Are you able to say whether any statute exists which provides for the transfer from the lump fund to the statutory roll of persons employed in this department after they have been on the roll for one year?

Mr. MOORE. I know of no law bearing on the subject at all, Mr. Chairman. There may be laws, but I know of none.

The CHAIRMAN. Do you know of any request or suggestion on the part of this committee that that be done?

Mr. MOORE. Let me understand your question. Is it if there is any law bearing upon the transfer from the lump fund to the statutory places?

The CHAIRMAN. Yes; after the man in question has been for one year on the lump fund.

Mr. MOORE. I do not know of any. I know those matters have been discussed for a long time.

The CHAIRMAN. Let me ask Mr. Zappone if he has any recollection of any such law.

Mr. ZAPPONE. There is no specific law. It is a request of this committee, which is very generally observed by the department.

The CHAIRMAN. I ask that question now because I remember in the debate last year when the bill was up on the floor it came up, and I expressed the opinion then that there had been a statute enacted as a part of one of our preceding appropriation bills requiring this transfer to be made. I was not sure but that the committee had taken some action upon it.

Mr. MOORE. I do not remember any.

The CHAIRMAN. I was unable to find a statute, so I concluded, as Mr. Zappone has suggested, that it was merely a request on the part of the committee, made several years ago.

Mr. MOORE. How long ago did the committee make that request?

The CHAIRMAN. Five or six years ago. I know Mr. Wadsworth was chairman of the committee at that time. Mr. Lamb, do you remember it?

Mr. LAMB. Yes; I recall the discussion of it very well.

The CHAIRMAN. Is there any particular reason why you make this transfer now rather than—

Mr. MOORE. Is there any law, Mr. Zappone?

Mr. ZAPPONE. Yes, sir. There is a provision in the appropriation bill for this year, tacked onto our bill in the Senate, requiring all clerical places to be transferred from the lump-fund roll to the statutory roll.

The CHAIRMAN. That accounts, then, for the transfer of the two inspectors at \$2,500 each. I presume that in all cases of transfer the salaries are just the same as now?

Mr. MOORE. Precisely the same, except in the next case.

The CHAIRMAN. "One chief clerk and executive assistant." You change the title by adding the words "executive assistant"?

Mr. MOORE. We change the title by adding the words "executive assistant."

The CHAIRMAN. And you ask for an increase of \$500?

Mr. MOORE. We ask for an increase of \$500. The salary was \$2,250 before. This is one special case that I wish to urge upon the committee. This man has been my chief clerk for seven years, and has been associated with me ever since I have been the head of the bureau. He becomes assistant chief when I am absent. When I am absent the assistant chief becomes chief and he becomes assistant chief. He is in line of succession and control of the bureau and often is in full charge of the bureau. He is an unusually able executive officer—unusually so—and he has been with me a great many years. His sal-

ary is inadequate to the office he fills, and is much below the salary of a dozen other men in the Government service in similar positions who receive larger salaries.

The CHAIRMAN. How long has he received his present salary?

Mr. MOORE. Seven years.

The CHAIRMAN. How long has he been in the bureau?

Mr. MOORE. Thirty-two years; and still he is not a very old man. He is about 48 or 49 years of age—somewhere along there.

Mr. CALVERT. He is 50 years of age.

Mr. MOORE. He is a young, active, vigorous man; and he is one of the best assistants I have in the Weather Service. I would like to make a special plea for this man, in preference to any other thing I request in this bill.

Mr. LAMB. What is the gentleman's name?

Mr. MOORE. His name is Carroll.

Mr. LAMB. That is what I thought.

Mr. MOORE. He comes from your State, Captain, does he not? You are sure he is a good fellow now, I know.

Mr. LAMB. Other States have just as good men, I know, but still I thought I knew him.

Mr. MOORE. He comes either from Maryland or from Virginia; I do not know which. It may be he comes from Maryland.

The CHAIRMAN. Recurring to the question which we had up a few minutes ago, to refresh the memory of the members of the committee, I will read the paragraph in the present appropriation law to which Mr. Zappone referred:

The Secretary of Agriculture for the fiscal year 1912, and annually thereafter, shall transmit to the Secretary of the Treasury for submission to Congress in the Book of Estimates detailed estimates for all executive officers, clerks, and employees below the grade of clerk, indicating the salary or compensation of each, necessary to be employed by the various bureaus, offices, and divisions of the Department of Agriculture.

I notice under the heading of "Eight clerks, class 4," you ask for an increase of one, and in subsequent items you ask for several additional clerks. I suppose you might as well state the reasons for all of them at one time.

Mr. MOORE. Mr. Chairman, let me go back, if you will, to this office of chief clerk and executive assistant.

The CHAIRMAN. Yes.

Mr. MOORE. If you will notice, there is one chief of division above, at \$2,750, and one chief clerk for whom I ask \$2,750 also, but who now gets \$2,250. These are two offices now in existence that have been in existence for years. Recently I have effected some reorganization at the central office that has enabled us to drop one of these offices, distributing the duties among several other offices. The salaries of these two men equal \$5,000—\$2,750 for one chief of division and \$2,250 for the chief clerk. Now, what I wish to do is this: I wish to cut out the chief of division entirely, and in lieu of that ask you to give us \$3,000 for one official, who shall be called chief clerk and executive assistant. You will save \$2,000 on that and we will drop one office.

Mr. LEVER. Does that man go out of the service entirely, then?

Mr. MOORE. Yes.

Mr. RUCKER. How long has he been in the service, Professor?

Mr. MOORE. The place is just now vacant, but it has been filled for a great many years. The place was filled for a long time before I came to the head of the weather service.

Mr. HAWLEY. You do not lose a valuable man, then?

Mr. MOORE. No, sir. In the reorganization I want to drop one division.

The CHAIRMAN. You would expect to pay the salary of \$3,000, if the committee granted it, to this chief clerk and executive assistant?

Mr. MOORE. I would expect to pay it to the chief clerk and executive assistant. It is a reasonable salary, and in this reorganization which I am effecting we can dispense with one office.

The CHAIRMAN. How many division have you in your bureau now?

Mr. MOORE. I would have to count them up.

The CHAIRMAN. Please state what they are, as you go along.

Mr. MOORE. There is the Forecast Division, where we make forecasts and distribute warnings. The salary of the chief is \$3,000. Then there is the Climatological Division, to which come all the records from the stations; in this division we verify the work of every observer. His original records come here, and in this Climatological Division we answer the hundred and one inquiries that come almost daily to the weather service from the various industrial and commercial interests with regard to the climate in one place or another; with regard to any conditions of weather that may apply to a particular industry. The salary of the former chief was \$3,000; a new man has just gone in as chief at \$2,000, who, we hope, will be advanced to \$2,500 in due time. Then there is the Instrument Division, where we test all of our instruments, and where we devise much of the apparatus that is now in use. This Instrument Division keeps supervision of the automatic instruments at 200 stations; salary, \$3,000. Then there is the Supplies Division, where we purchase all of the supplies that go to the various stations; salary, \$2,000.

Then there is the Publication Division, wherein we print the daily weather map, and the monthly weather review, the Mount Weather bulletin, and all printing that is not done by the Public Printer. We also print there and distribute the meteorological forms used by the bureau; salary, \$2,000. Those are five. Then there is the Marine Division, which has supervision over the observations taken by vessel masters. Several thousand vessel masters take observations every day and report to us, and from their observations we deduce the climatology of the oceans and publish charts; salary, \$2,500. So there are six principal divisions in this office.

The CHAIRMAN. Are the chiefs of those divisions all paid the same salary?

Mr. MOORE. No.

The CHAIRMAN. How do their salaries range?

Mr. MOORE. The chief of the Forecast Division gets \$3,000. He is a national forecaster.

The CHAIRMAN. Do you transfer him to the statutory roll from the lump fund?

Mr. MOORE. No, sir; he is in the scientific force.

Mr. HAWLEY. If you make this change that you suggest, you would make this the third officer?

Mr. MOORE. Yes, sir; he (the chief clerk) is now the third ranking officer in the bureau, and he is really the executive officer of the

Weather Bureau, and ought to be so called. He is a man to whom I can give a word and he will get the orders out. I do not have to explain the details to him. He understands it as well as I do. He is the kind of a man that a chief or director needs at his right hand in the carrying on of a big service. The salaries of the division chiefs vary from \$2,000 to \$3,000. Some get \$2,000; some \$2,500; some \$3,000—the salaries being adjusted, as nearly as we can adjust them, in accordance with the importance of the positions.

The CHAIRMAN. Are you prepared to state now what sort of reorganization you propose to make that will eliminate this one man?

Mr. MOORE. Yes. If the committee grants our request, we do not intend to fill that position at all, and we shall distribute the work of that division, as we are now in process of doing, between two or three other divisions.

The CHAIRMAN. What division is that the work of which will be distributed?

Mr. MOORE. This man is in charge of the distributing division of the office, distributing the reports, maps, bulletins, and forecasts. We are cutting that out and sending it into other divisions. I had little doubt but that the committee would approve our suggestion to drop a place if we no longer needed it and put a little more salary on a third officer, and so I have gone ahead and have practically effected that reorganization already.

The CHAIRMAN. Inasmuch as that involves a change in the form of the estimates, I would be glad if you would write me a letter stating succinctly what you want.

Mr. MOORE. Yes.

Mr. LEVER. If the committee does not act favorably upon your suggestion to increase the salary of the chief clerk and executive assistant here, would that interfere with your plan of dropping this one chief of division to whom you refer?

Mr. MOORE. No, sir; we should drop that office just the same, but it is a plan of economical administration. This man will have more work to do, and I believed the committee would think that the project was a reasonable one; and, although I had begun to work on the project, I believed they would carry out the other part at their end.

The CHAIRMAN. At the bottom of page 7 you say:

Four monotype operators, who shall also be compositors, at \$1,500 each (one by transfer from lump fund for general expenses, printing office, with change of title and increase of \$250, and three in lieu of three compositors at \$1,250 each, on statutory roll, with increase of \$250 in each case).

In what way do you eliminate these titles, and why do you ask for that increase?

Mr. MOORE. That is to make the salary of the monotype operators the same as is paid in the Government Printing Office. We have had difficulty in getting any operators at all.

The CHAIRMAN. What is the present title, and what will it be when you change it?

Mr. MOORE. They are compositors now; but let me say right there, Mr. Chairman, that you do not have to act on that, for since making these estimates I have been in negotiation with the Public Printer with a view of transferring all of these people over to him, and within a few days I shall probably be able, before you get the bill formulated, to come before you with a project to drop all of these

monotype operators and several other employees here for whom we have asked a change in salary.

The CHAIRMAN. With the expectation of transferring the work which they are doing to the Government Printing Office?

Mr. MOORE. Yes, sir; with the expectation of transferring the work over there, retaining at our office only the lithographing, which they do not do at the Government Printing Office, and just one little press for printing orders.

Mr. LAMB. Do you think that would be more economical?

Mr. MOORE. Well, we are crowded for space. We are very much crowded for space in the Weather Bureau; and now, in order to keep up with our work, we have under contract a press for about \$2,700 to keep up with the work there; but we find that we are having difficulty in getting room for that press. Our office is expanding, and we are crowded for space. Our printing is large. We do a great amount of printing, and so I thought possibly the present time was the proper time to transfer it over to the Public Printer. I have opposed that transfer heretofore because I think we can do it as cheaply, if not more cheaply, than he can do it. We can do it as cheaply anyway. But we are in the weather business, and we are not supposed to be in the printing business. It is the idea all through the Government service now to combine work of a similar character under one head; and I think the general thought is a good one.

The CHAIRMAN. How many monotype operators have you in your office.

Mr. MOORE. We have four monotype operators. We transfer these monotype machines and all of the machinery that we will not need over to the Public Printer, and our allotment with the Public Printer will be increased under another bill so as to provide for the printing of such reports as can be as well printed there as in our office. There are certain reports that must be printed in the Weather Bureau office, and we must have a few printers.

The CHAIRMAN. Why is it necessary to have any of them printed there?

Mr. MOORE. For the reason that we have several printers on duty right in the Forecast Division, who must be conversant with our work, who place in type meteorological data that goes in on the weather map almost as fast as it comes from the telegraph wires.

The CHAIRMAN. To expedite the work of forecasting?

Mr. MOORE. Yes. We must have lithographing presses adjacent, all ready to take the data out of the Forecast Division and put it on the lithographing stones, but there must be no delay between the telegraph office and the Forecast Division and the Printing Division. So we have to keep one or two presses there; and we need one compositor and one small platen press so that we can print orders at any time; there then will be no delay in issuing them. That is well understood by the Public Printer.

The CHAIRMAN. But touching the other matters, you think you will be able to present a recommendation to the committee before we are through with the bill that will eliminate several of these items?

Mr. MOORE. Yes. It will eliminate all these changes in the salaries and promotions that we have suggested in regard to the monotype operators.

The CHAIRMAN. We will pass that for the present, then.

Mr. MOORE. Had you passed these several clerks that I had asked for, back on page 7?

The CHAIRMAN. Yes.

Mr. MOORE. There is 1 clerk of class 4, 2 of class 3, 1 of class 2, and 2 of class 1, and 1 at \$1,000. These several additional places are asked for to keep pace with the growth of the service. You must understand that as the cities increase where we have Weather Bureau stations the demand for greater distribution of weather information grows apace, and we have had, as you know, very little increase in the appropriation for any part of the Weather Service for a number of years.

The CHAIRMAN. To what extent is this request for additional clerks predicated upon the supposition that the committee will allow the increases for general expenses that are asked for later on?

Mr. MOORE. It is predicated on that somewhat. Further over we have asked for \$50,000 for telegraphing our reports; and we ask some additional money, \$20,000, for supplies for our stations, because of the increase in the cost of everything. We ask something additional for rents. Rents are going up on us wherever we have stations; and as fast as our leases expire, in pretty nearly every city we are met with a demand for an increase in the rental which we have to meet, provided it does not go beyond the commercial rate for the rest of the building. So these clerks, on page 7, are part of the whole scheme that brings about an increase in the Weather Service.

The CHAIRMAN. Since that is true, I think we might as well consider them together, and ask you to discuss the reasons for the increase in the general expenses which you ask for.

Mr. MOORE. Over on page 10, "For the employment of professors of meteorology, inspectors, district forecasters, local forecasters," etc., we ask for an increase there of \$30,000 for the working force of 200 meteorological stations.

The CHAIRMAN. Does that contemplate the addition of any new stations?

Mr. MOORE. Not necessarily so.

The CHAIRMAN. How can you use the men? Are not the stations you now have sufficiently equipped with men?

Mr. MOORE. They are not sufficiently equipped. We are declining to do a great deal of the work that is demanded of us because we can not meet the demands that are made upon us at the various stations.

The CHAIRMAN. Can you give us a specific illustration of that?

Mr. MOORE. Oh, yes; hundreds of them.

The CHAIRMAN. One will suffice. I just want to get a specific case that will illustrate the demand.

Mr. MOORE. That can be well shown, I think, if I take up just here and give you a brief résumé of the requests made upon us since the 26th of last May for an extension of the weather service. All this extension of the weather service means additional labor on the part of the various stations of the Weather Bureau. For instance, here is E. W. Stephens, president of the Commercial Club, Columbia, Mo. He wishes reports sent to Columbia, Mo., from 20 of the large stations of the service.

Now, let me say as a prelude, that not a single inquiry that I shall read is either directly or indirectly prompted by any employee of

the Weather Service. These are unsolicited demands made by commercial interests upon us. Here is a demand from Peoria, Ill., by George C. Murray, forwarded and recommended by Hon. Joseph V. Graff, that the Peoria report be published in the Chicago papers and be added to the Chicago map and sent to other cities. We might send the Peoria observations out, because we telegraph the Springfield observations; but our fund is not sufficient to enable us to distribute over our circuit more than one-half of the 200 observations that we take daily. The general passenger agent of the Northern Pacific Railroad wants the Yellowstone Park observation put on our circuits so that people going in that direction may know the conditions in the park. We have an observation station there. We do not distribute that observation extensively, but we maintain quite an expensive installation in the park, and the people ought to know, during the tourist season at least, the conditions in the park.

The CHAIRMAN. Compliance with that request would depend on your appropriation for telegraphing, would it not, and not upon clerk hire?

Mr. MOORE. I am reading to you requests for additional telegraphic service. All these requests involve additional labor somewhere or other in the service, either of one or of many different persons, in picking up information and in the dissemination of the information asked for. W. H. Whittaker, district passenger agent Northern Pacific Railway, also wants the Yellowstone Park observation distributed. Thomas S. Young, of the New York Produce Exchange (he is president of it, I believe), asks for a large number of reports from the grain-growing section of the West, to have them appear on the New York map, and on the map that goes to all the commercial organizations in New York. C. C. Rubins, chairman of the committee on information and statistics, New York Produce Exchange, wishes the forecast made at Chicago distributed in New York. The New Jersey Foundry & Machine Co., of New York, wishes observations from Key West distributed, so that they will appear in the northern papers.

H. W. Rubins, New York Produce Exchange, wishes grain reports and observations in the grain belt. William V. King, superintendent of the New York Cotton Exchange, New York, desires a large increase in the number of reports telegraphed to all our circuits. R. C. Taggart, of New York—I do not know what his status is—wishes the Grand Rapids, Mich., report telegraphed. The Secretary of the Chamber of Commerce of Missoula, Mont., writes in the interest of having the Missoula observation distributed more extensively. Dan D. Morse, treasurer of the Boston Chamber of Commerce, wishes to have on the Boston weather map and placed before the Boston Chamber of Commerce the observations at Cincinnati, Ohio; Indianapolis, Ind.; Springfield, Ill.; Wichita, Kans; Lynchburg, Va.; Atlanta, Ga.; Omaha, Nebr.; and Concordia, Kans. Maguire & Jenkins, New York Produce Exchange, desire more observations of the grain-growing section.

I have several pages to read from, Mr. Chairman. I do not believe I need tire the committee by putting all in the record. There is an enormous lot of these demands, and I am simply giving you a few samples. I have read those just from one page, and here are seven pages.

The CHAIRMAN. It is obvious that to comply with those requests, or any considerable portion of them, would involve greater telegraphic expense. But I am a little at a loss to understand how it would necessarily require additional clerk hire. I know that the observers in stations that I am acquainted with would have ample time to write a few more telegrams during the day.

Mr. MOORE. Yes, yes. Every observation, every additional observation, that we put on the circuits must be received at certain centers. At certain of these centers we have our own men receive these observations, and they split them up and divide them into messages that are distributed over a large number of circuits. Every additional observation that is telegraphed requires considerable additional work in handling. It must be printed on the maps of the stations, it must be shown on the maps of the various boards of trade, and it requires additional work. Of course the work in connection with each particular observation is not great, but when you keep adding day by day a little increment all the time, as we have been doing for years, you finally get the working force working up to the limit. Many of our observers work really more than the legal limit.

Now, let me answer your question a little more fully. Why, whenever there is a storm or a flood, or a cold wave on hand at an important station, it keeps one or two men busy answering the telephone—one man at the phone all the time, and maybe two or three more busy getting information to give him to be telephoned. That wire is busy all the time. Sometimes they have to give us special facilities for telephoning in the big cities.

The point is now, Mr. Chairman, that in this station service there has practically been little or no increase for a great many years while the demands are growing all the time. We could not close a weather station anywhere in the United States without having to fight everybody in the community.

Mr. HAWLEY. Do you think the requests in the list from which you are reading are such as ought to be granted?

Mr. MOORE. Practically all of the requests on that list are good requests that ought to be granted; yes, sir.

The CHAIRMAN. Are you discussing the first paragraph under the head of "General expenses," on page 10?

Mr. MOORE. Yes, sir.

The CHAIRMAN. "For the employment of professors of meteorology," etc?

Mr. MOORE. Yes, sir.

The CHAIRMAN. Just one minute, before you pass from that. On the face of it that paragraph would seem to involve an actual reduction of some \$84,000 from the present law.

Mr. MOORE. That is because of the places that are transferred over to the statutory roll. They are transferred without any change in the salaries.

The CHAIRMAN. Taking them into account, there is a little increase of about \$30,000?

Mr. MOORE. Precisely, taking them into account. There is a decrease in the fund—a large decrease—due to the transfer over to the statutory roll of a number of places that are not scientific.

The CHAIRMAN. About what proportion of that proposed increase do you think would go to promotions, to increased salaries?

Mr. MOORE. I will say that we have a large number of assistant observers working for \$60 a month, and under present conditions we can hardly keep an assistant observer at \$60 a month. We would like to increase the entrance salary of our assistant observers from \$60 to \$70 a month. We pay but \$60 to a young man who comes into the service, who must pass an examination in elementary physics and mathematics, and I am finding that our eligible register is not what it used to be. We get but few men who pass much over the 70 mark. The better men will not come into our service at \$60 a month.

The salary scale has grown so in every line of industry that we can not get the men we want any more at \$60 a month. A portion of that \$30,000, probably ten thousand, would go to increase the salaries of \$720 observers.

The CHAIRMAN. Did you make any sort of a tentative estimate as to the men you would employ and the places where you would put them in order to arrive at this sum of \$30,000?

Mr. MOORE. Well, I made a cursory survey over the whole service, yes; but not a detailed survey. It could all be used to excellent advantage. If you will stop to think, you have been increasing year after year the other bureaus of the Government, especially the bureaus of our department. You have been increasing them largely, not by mere little pittances of \$10,000 or \$20,000, but by leaps and bounds, and properly so doing. I am not criticising it at all. Some of them have jumped from a few thousands to several millions in a short space of time. We are doing a service that appeals to the great commercial interests of the nation. They want more of it, and we are trying to meet that demand. We have no motive, of course, except to meet that legitimate demand; and our salary scale in many cases is much too low and has not kept growth with the extension of the service, which has to extend as the size of the country increases and as the size of cities increases. As these increases have taken place, the demands for more reports have increased, and the demands upon our service in all its lines of activity have increased. It is only natural that we must have a little increase as time goes on. If you will look back at the records you will see how long it has been since we have had any increase in that fund. It is now due, Mr. Chairman.

The CHAIRMAN. May I ask if this estimate is the one you originally sent in to the Secretary, or did he cut it?

Mr. MOORE. He did not cut this item. The secretary cut \$190,000 out of my estimates which pertained to other items.

The CHAIRMAN. As we go along will you indicate where he cut it?

Mr. MOORE. Yes, sir.

The CHAIRMAN. Now, you ask for \$50,000 increase for fuel, gas, electricity, freight and express charges, furniture, stationery, and all other necessary supplies. Will you let us have a word about that?

Mr. MOORE. We ask for \$20,000. From that fund we supply our 200 stations outside of Washington, and the rate on everything has increased. It is a mere matter of increase in price. If we are to keep our equipment up we can not do it for the same amount we formerly had.

The CHAIRMAN. What is the nature of the equipment that has to be continually renewed year after year?

Mr. MOORE. Let us see. Fuel. That is subject in increase, but not very much, because it is now about as high, it seems, as it possibly could get. Gas is about the same. Electricity, freight, and express charges are about the same. Furniture and stationery. There, of course, increases come in. And all other necessary supplies and miscellaneous expenses. There is an increase of probably 30 to 50 per cent on many of those things. I can not give it to you more closely in detail than that.

The CHAIRMAN. Did you find that you were unable to meet the reasonable requirements of the stations with the fund you had this year?

Mr. MOORE. Yes. To be sure, you may deprive the station of necessary things to keep up the equipment and use old and imperfect apparatus; but if you keep your equipment up well it requires an increase in the appropriation. We try to do that in the Weather Service. We take pride in the appearance of our Weather Bureau offices, and we exact very rigid discipline—that they shall be kept clean and neat, and everything in thorough repair. We do not think that we are extravagant, but to keep the equipment up with the advancing prices of the times requires that we have a little gain in the appropriation.

Mr. LAMB. Have the freight and express charged increased?

Mr. MOORE. They would not change very much.

The CHAIRMAN. Passing to the next item, you ask \$5,000 additional for instruments, shelters, apparatus, storm-warning towers, and repairs thereto.

Mr. MOORE. Well, the same argument naturally applies there.

The CHAIRMAN. You eliminate the appropriation, of course, for weather-bureau building at Sand Key. Has that all been completed?

Mr. MOORE. The island has been washed away since that appropriation, Mr. Chairman. There is no island there now.

The CHAIRMAN. What did you do with the money?

Mr. MOORE. We are going to build that building just the same.

The CHAIRMAN. Where?

Mr. MOORE. We are planning to drive concrete piles into the coral reef. The island originally was only a few feet above the tide level. How much was it above tide level, Mr. Calvert?

Mr. CALVERT. About 5 feet.

Mr. MOORE. This recent hurricane of which I told you came through there and washed all the sand off of the coral reef. The light-house is standing there, and our observers—three men—got quarters in a room that was about 9 feet square. They have been there for several months. They can not abandon the station, because it is right in the fairway of the vessels passing in and out of the Gulf. It is through us that all of these vessels communicate with the land, either by one form of signal or another. We also take observations and display storm signals to vessels there every minute of the 24 hours, the same as a Cape Henry, Va. So we must have the building there. As you remember that building was washed away by the hurricane one year ago. We moved the men out just a few hours before the storm came along, and it took the building up and carried it away. When we constructed the other building, we

anticipated that a hurricane might come along and wash the island out of existence, so we elevated the building 8 feet high.

Mr. CALVERT. About 8.

Mr. MOORE. A hurricane came a year ago and took it away. I have just had a report from there that indicates that the water rose about 10 feet over the island; so we are planning to put this building on concrete piles 18 feet above ordinary tide level.

The CHAIRMAN. That new building will be erected practically on the site of the old one?

Mr. MOORE. Practically on the site of the old building. The building at Key West in the recent storm was so badly wrecked that I shall come before you a few days later to see if you will not give us an opportunity to present a supplemental estimate from the Secretary of Agriculture for a fund to reconstruct out of brick and mortar the building at Key West, which, in this recent storm, was so badly wrecked that I doubt if it will pay us to repair the old wooden building.

The CHAIRMAN. You ask for \$15,000 additional for the rent of offices and repairs to buildings.

Mr. MOORE. Mr. Chairman, as I said a little while ago, whenever our leases expire we find there has been an increase in the price of floor space in nearly all the commercial centers. We have to meet that or get out. Within the last few months, for instance, we have been compelled to pay \$2,500 additional rent in the city of New York; in Chattanooga, Tenn., \$1,000 additional; in Salt Lake City, \$480 additional; in Seattle, Wash., \$420 additional; in Savannah, Ga., \$180 additional; in Corpus Christi, Tex., \$180 additional; and in Helena, Mont., \$120 additional. Again, in many cases we are compelled to move by reason of the growth of the cities. Where higher buildings are erected around our instruments we must go to a higher place, so that the shadows shall not fall upon our apparatus, or the wind currents interfere with it. We must do that, or build structures of our own.

The CHAIRMAN. Now, passing to the next paragraph, "For official traveling expenses, \$22,000."

Mr. MOORE. That is the same.

The CHAIRMAN. The same as the present appropriation?

Mr. MOORE. Yes.

The CHAIRMAN. How is that appropriation expended? Do you keep inspectors in the field, and is it their expenses chiefly?

Mr. MOORE. We keep only two regular inspectors in the field. We aim to cover the whole service once in two years with these two inspectors. Then we have subinspectors, who are the observers. As an illustration, the observer at Jacksonville, Fla., for instance, will have under his supervision the displaying of the storm warnings for a certain distance north of him on the coast and a certain distance south of him on the coast. He will have under his supervision the low-salaried employees, who get \$10 and \$15 a month, and some very few \$25, who display the danger signals to the mariners. Once a year he will make a trip up the coast line and down the coast line and look over those substations. He is near and his traveling expenses are small. He may also go out in the orange groves of Florida and inspect the cooperating stations—stations that pay no

salaries and where they simply have a set of Government instruments and from which we get observations without expense to the Government, except for the equipment. Some of this is expended, as I say, by subinspectors inspecting the local services contiguous to their territory. Another portion of the fund is expended paying the travel expenses of observers who are ordered to new stations, as when we order a man from New York to Chicago or from Chicago to Chattanooga, for instance. Our traveling expense is not large, considering that we have 200 stations.

The CHAIRMAN. I presume that these expenses, as is the case with all other bureaus of the department, are paid on vouchers?

Mr. MOORE. On vouchers.

The CHAIRMAN. And are only actual expenses?

Mr. MOORE. Actual expenses.

The CHAIRMAN. These inspectors, I take it, simply visit the various stations to see that the instruments are properly kept and are in good repair, and things of that sort?

Mr. MOORE. The inspector visits the station and searchingly goes through all the records to see that they have been kept in accordance with instructions, that they are neat and legible, and he examines every instrument to find that it is in perfect working order. He interviews representatives of commercial or marine interests to find out if our observers are efficiently serving them, and makes inquiry of each and every man if he has any complaint. In other words, it is a searching inquiry into the working of each subordinate station.

The CHAIRMAN. The next paragraph is: "For telephone rentals and for telegraphing, telephoning, and cabling reports and messages," etc. You ask for an increase of \$50,000. Is that intended to meet, in some degree, the demands that you have for additional service?

Mr. MOORE. Well, I have already explained the need for telegraphing, and I only read a few illustrations of the numerous inquiries that come to the weather service.

Mr. McDERMOTT. Have the telegraph companies raised the rates on you in the past few years?

Mr. MOORE. No; our rates have remained the same for a number of years.

The CHAIRMAN. And your contracts continue for some time to come, do they not?

Mr. MOORE. Yes, sir.

The CHAIRMAN. Can you state how many different requests you have for additional service?

Mr. MOORE. Yes, Mr. Chairman. Now, since the 1st of January—nearly a year—the Port Arthur (Tex.) Board of Trade has forwarded a request for a station at Port Arthur, commended by Hon. Martin Dies, a Member of Congress. There were several previous requests in 1908 and 1909, commended by Senators Bailey and Culberson.

The CHAIRMAN. I am asking for the number of the requests for the additional service. Just give the number.

Mr. MOORE. What do you mean by "additional service"? Do you mean additional telegraphing service?

The CHAIRMAN. Yes; additional telegraphing service.

Mr. MOORE. Oh, yes. I can give you that in an instant. I have counted 24 on that page [indicating], and they are all about the same. There are five and a half pages.

The CHAIRMAN. Have you made any estimate of the amount it would cost to comply with all those requests?

Mr. MOORE. Not specifically; for the reason that each request might be complied with in a different way. For instance, they want certain things, and we can see what the institution wants sometimes better than they can.

The CHAIRMAN. Then in what way did you arrive at this sum?

Mr. MOORE. Why, by going over the whole situation, and by making a most thorough examination of all of our circuits. I reorganized every telegraphic circuit, spending two or three months in the work, even bringing in an expert from the Western Union to see if he might help us, so that we could get the most thorough distribution with the money at our command. I could see from that that in order to meet these various requests it would take \$50,000 to cover the ground.

The CHAIRMAN. I notice by a statement which I asked Mr. Zappone to prepare for me that you will probably turn back of this fund about \$3,800 this year.

Mr. MOORE. Yes. Before I answer about the money that goes back, let me answer a little more fully about the \$50,000.

The CHAIRMAN. Yes.

Mr. MOORE. And to say that to completely distribute all the observations that we make, and which would be appreciated by the commercial interests, would probably take \$100,000. I have asked for \$50,000 additional, because I thought I could get through with \$50,000. With regard to the turning back of a few thousand dollars—thirty-eight hundred dollars—of our fund, I will say that we can not estimate exactly how much it will take to run our service for the next 30 days in advance because of the variable character of storms, some consuming more money than others, and we must not have a deficit. I think there is a penitentiary sentence for an executive officer who creates a deficit, and I am afraid of going to the penitentiary. [Laughter.]

We have to lay out our scheme of expenditure several months beforehand. We lay out a scheme of expenditure that we think will go through to the end of the year, but we may have to alter that every three or four months, as the case requires. When we arrange to give to certain commercial interests a definite number of reports, which before the fiscal year ends we have to take away, there is complaint and they can not understand it at all. They must have the reports and that is all there is to it. Therefore we have to lay our plans so as to be sure that we have enough money to cover the expenditures to the end, as closely as may be. I have, in time gone by, found by the 1st of May or June that the telegraph money was going to run out, because of the excess of precipitation throughout the county, or other cause. Then I would have to arbitrarily step in and deprive somebody of a part or all of their telegraphic service; and it is hard to explain to them why you have taken it away. But you simply have to take it away from some if you have not enough money to give it to all.

Mr. LEVER. What provision have you made for new weather stations? Have you made provision for any at all? Have you any estimate of it?

Mr. MOORE. Let me take that up now, Mr. Lever.

Mr. LEVER. We can come back to that, Mr. Moore.

The CHAIRMAN. Passing, now, to the next paragraph, you ask for no increase for the maintenance and repair of Weather Bureau telegraph, telephone, and cable lines, and I presume the \$4,000 is therefore still about what you require.

Mr. MOORE. Yes, sir.

The CHAIRMAN. You have expended just about that sum during the present year?

Mr. MOORE. Yes, sir.

The CHAIRMAN. The next paragraph calls for investigations in climatology and seismology and evaporation, including the erection of temporary buildings for living quarters for observers, etc. In that there is the same appropriation as last year.

Mr. MOORE. The same.

Mr. LAMB. You have a reduction, have you not?

Mr. MOORE. Let me see.

Mr. CALVERT. It is the same appropriation as last year.

Mr. MOORE. You have cut it down, have you not? That is reduced somewhat, Mr. Chairman, because some of those employees are transferred over to the statutory roll.

Mr. CALVERT. No; that is the paragraph below.

Mr. MOORE. I was on the wrong paragraph; yes.

The CHAIRMAN. This paragraph does not seem to indicate the sum that was appropriated last year, unless it is the same.

Mr. MOORE. It is the same. It is from that fund that the Secretary cut out \$40,000.

The CHAIRMAN. There are several changes in the paragraph. You ask for the insertion of the word "seismology?"

Mr. MOORE. Yes.

The CHAIRMAN. For what reason?

Mr. MOORE. That is to authorize what we have been doing for 20 years or more in the Weather Service. We have always had seismological apparatus, and our Prof. Martin, mechanical engineer, is probably the most expert man in the United States, if not in the world, in the devising of seismological instruments.

The CHAIRMAN. Are not all of your stations now equipped with these instruments?

Mr. MOORE. They are not all equipped—only one. There is one instrument working here in the city of Washington.

The CHAIRMAN. I understand that the addition of this work would not involve any extra expense, so far as this paragraph is concerned?

Mr. MOORE. No.

The CHAIRMAN. To what extent would you expect to equip the stations with seismological instruments?

Mr. MOORE. I will tell you. That would give us the authority, so that there would be no question about our authority to do what precedent has for years caused us to do. It would show our authority more completely. There has been no question raised on it. Has there been, Mr. Calvert? It might have been raised once, and that caused the question to come up.

Mr. CALVERT. Mr. Scott wrote a letter last year in regard to it.

Mr. MOORE. Oh, yes; that was it. I will say this: We have in this office a complete installation, and the newspapers get out reports in regard to the occurrence of earthquakes. We could, with but little additional expense, have seismological instruments at the various places where we have Weather Bureau buildings. They do not require much attention after they are once installed, especially if you have trained meteorological observers on the ground; those that can adjust the instruments once every few days, as they need to be adjusted. Now, there is an insistent demand being made before another committee of Congress for the creation of a seismological bureau.

The CHAIRMAN. Where do they propose to place that bureau? In what department?

Mr. MOORE. Why, I do not know in what department they purpose to place it. Furthermore, there is also a proposal to create what they call a seismological laboratory in the Smithsonian Institution, each of these projects involving considerable expense—the seismological bureau, I think, involving an expenditure of about \$200,000.

The CHAIRMAN. From whom does that demand come?

Mr. MOORE. From the scientific interests and from construction engineers. The point I wish to make is this, Mr. Chairman, if you give us that authority in the bill here, whatever need the Government has for seismological data can just as well be met by the observers of the Weather Bureau with very little expense—almost none—and if you do not do it, you will leave the field open, and there will come the inauguration of an elaborate seismological bureau at great expense, which will be established separate from the Weather Bureau. So if you give us that authority there, with no money, we may expend from our instrument fund to install here and there a few seismological instruments—

The CHAIRMAN. About how many stations do you contemplate equipping?

Mr. MOORE. Oh, I would say 10 or 15 of our stations. It may be that in the course of time we would want to equip 20.

The CHAIRMAN. What would the instruments cost?

Mr. MOORE. It would probably cost only \$500 to install a set of instruments at each station. That is because we already have the buildings and ground where they may be installed, but if you had to rent buildings and employ separate observers each installation would probably cost \$5,000 instead of \$500 and the expense be continuous.

The CHAIRMAN. I presume that you have such instruments in San Francisco, have you not?

Mr. MOORE. No, sir; we have no instruments there. We wish to put some there.

Mr. LAMB. Where have you them now?

Mr. MOORE. In the city of Washington only.

Mr. HAWLEY. Would the establishment in these places of seismographs meet the demand of the interests you have referred to, and would they acquiesce in that?

Mr. MOORE. I am able to answer that in this way. The American Association for the Advancement of Science which, as you know, in-

cludes practically all of the scientists of the United States—several thousand—two years ago appointed a committee to consider this matter of the Government taking seismological observations. The American association appointed a subcommittee to consider this whole matter, and they met here in Washington, and they called into consultation all of the various scientific bureaus of the Government; and then they rendered a report to the American Association for the Advancement of Science that the bureau of the Government that could most economically and efficiently do this work was the Weather Bureau.

I was not a party to that in any way, and I have no desire to do the work if you can find any place to do it better and more economically than it can be done by us. It is a problem that belongs more to the geologists than to meteorologists, but the geologists have not stations scattered over the United States where they may install instruments. On the other hand, seismology has a relation to meteorology, for we do not know just what the effect is upon the earth of the displacement of a large mass of air from one part of the continent to the other part. If you stop to think for a minute, a change in the pressure of the air indicated by a difference of 1 inch of mercury means 70 pounds per square foot. So when a storm comes up which lowers the pressure over the eastern part of the United States by 1 inch of the barometer, it means over the Mississippi Valley that there are 70 pounds per square foot greater pressure bearing upon the earth. Thus, inequalities of pressure due to a storm displacing the air from one place and banking it up in another, may possibly result in initiating a seismological disturbance.

As to the necessity for the United States making measurements at a number of our weather stations of the vibration of the earth: I will say that there is not a constructing engineer who does not wish to know from what direction come these waves, and what is their amplitude, so that he may construct his steel structures and make them practically earthquake proof. There were no modernly constructed buildings in San Francisco that went down. We are beginning to find that we can construct steel buildings so that you can throw them up in the air and drop them down and they will stand there. The walls may fall off, but the structure will stand and the engineer wishes to get all the information he can about the movements of these earth waves, so as to construct his buildings with the idea of making them proof against collapsing when the shock comes. It is apparent that the Government will have to do the work sometime. The weather service is in condition to do it more economically than anybody else.

Mr. HAWLEY. How large an area does your seismograph here in Washington record for?

Mr. MOORE. We get shocks from clear around the earth sometimes. We have been getting vibrations that we are satisfied come to us from 10,000 miles away. We can, by even one instrument, get a pretty good idea of the distance from the center of disturbance when we get a shock here, and a pretty close idea as to the direction whence the shock comes.

Mr. Chairman, I would like for you to hear the statement that I just made.

The CHAIRMAN. I will read it very carefully. I was called out for a moment.

Mr. MOORE. If you will permit me, I will repeat part of it. The American Association for the Advancement of Science, which is composed of practically all of the scientists in the United States, appointed a committee to consider the whole subject of to whom should be given the authority to take these seismological observations; and they consulted with all of the scientific bureaus here that were interested, and their report was that the work should be done under the Weather Bureau. Furthermore, I said that the Weather Bureau could do this work for very little additional expenditure, because it has stations, equipment, and buildings, and grounds, and is the only institution that has scientific observers scattered over the United States that could do the work economically. So if you give us the authority in the bill here we will probably meet all the needs that could ask to be served through an elaborate seismological bureau.

Mr. HAWLEY. Do the Smithsonian people agree in wishing to place it in the Weather Bureau?

Mr. MOORE. They have concurred in it in a report of the scientific committee several years back; but you did not give us the authority to do it; and now they are asking for an appropriation to establish a seismological laboratory, as they call it, which, I presume, they would not ask for if we could have authority to do the work.

The CHAIRMAN. Do you know, or have you stated, who is making this request before the Committee on Appropriations?

Mr. MOORE. I can not give you the names of the scientific people who are agitating that.

The CHAIRMAN. It comes from the outside, does it, and not from the Government service?

Mr. MOORE. Oh, yes; it comes from the outside. But the point I am making is that I am still satisfied that they would have no need to ask for a seismological bureau if some bureau of the Government were taking seismological observations. Then any student anywhere in the United States could come to the Weather Bureau, or send there, and get reports, which would assist him in his studies. Any mechanical engineer could come and find out all these things in regard to the vibrations of the earth, that are going on more or less all the time.

The CHAIRMAN. Do you know whether any bill has been introduced to carry it out?

Mr. MOORE. Yes; a bill has been brought before one committee, of which Mr. McCall is a member; but I do not know what it is, because he asked me about the need for the expenditure.

Mr. LEVER. About what part of the sum of \$120,000 would you use for the establishment of these stations?

Mr. MOORE. That, if made at all, would largely come out of the instrument appropriation, where I ask for an additional appropriation of \$5,000. There might also be a little expense for installation that would come out of the other fund. We could probably put out a few instruments during the coming year, if you put that word "seismological" in there, provided we got any increase; and we need the word in there so as to make clearer our authority to do what has been done for over twenty years. There are many useful things, Mr. Chairman, that we could do with a little increase, and we should try and use economically in the various ways whatever you gentlemen see fit to give to us.

The CHAIRMAN. I understand that aside from installation no additional expense would be involved?

Mr. MOORE. No; practically none; because the instruments require but little attention after they are once properly installed.

Mr. HAWLEY. And the observers where you would place them are qualified to care for them, are they?

Mr. MOORE. Our meteorological observers are thoroughly qualified to care for them. Our mechanical engineer would have to make one trip out to install and set the instruments running.

The CHAIRMAN. Referring further to the same paragraph, you eliminate the words "engaged in evaporation work." What is the reason for that?

Mr. MOORE. Because all our people are practically engaged in evaporation work more or less, and we are taking observations at a great many stations on that very problem. It was highly necessary to put that in there at one time, and we put that in there especially to cover the living quarters of people specifically engaged on evaporation work down at the Salton Sea. That is one reason. The specific matter in this bill is to reach the forest reserve, where we are carrying on this cooperation with the Forestry Service. There we might wish to erect a little temporary shelter for a man, or a temporary abode for him to live in, that could be pulled down or burned up when he went away. It is not absolutely necessary to cut it out. It would be a little better to cut it out.

The CHAIRMAN. I remember that you asked to have the language providing for the erection of temporary buildings for living quarters for observers in order to meet the necessities at the Salton Sea; and I wondered, since those buildings must have been erected now, whether it was necessary to retain that language in the bill. How are your observers in the Rio Grande Reservation now being housed?

Mr. MOORE. I will tell you. The Forestry Service has constructed buildings out of their fund that we are using, but we may need that authority even there before we get through, or need it in some other case. They have erected temporary structures there, and our observers are living in them. So we do not need to use the authority there. We might need to have the authority at another place, and it might hamper us not to have it.

The CHAIRMAN. In what way would it hamper you?

Mr. MOORE. Suppose we were to come over to the Appalachian Range some time and open up an inquiry there. We might need that authority there, so that we could put up a shack that might cost, say, \$500. There is no great expense involved. That authority would be used with the greatest discretion. We do not want to live in out-of-the-way places any longer than we have to.

The CHAIRMAN. Can you give us a statement of the amount that has been expended during the past two years under this authority?

Mr. MOORE. There has been no expenditure under that, except in the Salton Sea region, and you have that amount in your mind, have you not, Mr. Calvert? I think it is about \$10,000.

Mr. CALVERT. The evaporation towers and buildings combined cost about \$9,000; but the buildings themselves probably cost about \$900. The biggest expense was the building of the towers out in the sea.

Mr. MOORE. Our greatest expense was the building of the towers out in the sea, which was abandoned when we got away.

Mr. CALVERT. We have spent nothing, practically, for some time on this.

The CHAIRMAN. Tell us something about the work in the Salton Sea. What do you think you have gotten out of it, and how much longer do you expect it to continue?

Mr. MOORE. We are gradually closing up the work there. The two men I have now carrying on this inquiry in cooperation with the Forestry Service I have taken out of the Salton Sea force.

The CHAIRMAN. Is that work, then, abandoned?

Mr. MOORE. It is being gradually closed up. I have those men working in the forest investigation now.

The CHAIRMAN. Is there nobody now at the Salton Sea?

Mr. MOORE. I have closed nearly all of the work there. Have we anyone left there, Mr. Calvert?

Mr. CALVERT. I think it is about all closed up.

Mr. MOORE. Yes; it is about all closed up there. I have no one there now on salary.

The CHAIRMAN. What did you do with the buildings that you erected there?

Mr. MOORE. We sold them at auction. We did not get much for them, did we?

Mr. CALVERT. Not very much.

Mr. MOORE. There was nobody there to occupy them.

Mr. HAWLEY. They were wooden buildings?

Mr. MOORE. Yes; they were just little shacks.

The CHAIRMAN. Do you care to make any statement in regard to the practical results of the work?

Mr. MOORE. We have that report now in. I want to give you some data here that might interest you in regard to that. I have it right there. We found, Mr. Chairman, that with a tower 150 feet from the water and with a pan placed on the ground the total evaporation for the year was 165 inches, and 40 feet from the ground it was 193 inches.

We have estimated that, considering what little rainfall runs in there, the loss is about 6 feet per annum by evaporation in this region. The deductions on these observations are in process now of study and consideration.

Mr. HAWLEY. Is there any water pouring into that sea from a canal or anything like that?

Mr. MOORE. There is a little water coming in; but very little. The sea is losing at the rate of 55 inches, or 4 feet and 7 inches a year, but the evaporation is 70 inches. We have scientific people discussing the observations that we secured there with a view, if possible, of getting a better formula than had before been used for determining the rates of evaporation with a given temperature of air and of water, with a given wind velocity and a given aridity of air. Just how much use we will get out of it I do not know yet.

The CHAIRMAN. You are not prepared as yet to state what practical results in correlation with the work of the Reclamation Service you have obtained?

Mr. MOORE. Even if we get a negative result, it will be useful for the Reclamation Service, because the engineers all over the world have been waiting and looking for a formula that will enable them better to determine what they will lose from a given surface of

reservoir. Just how well our formula will meet the test I do not know as yet. It is too early to say. It is a difficult problem, but it is one that had to be investigated.

Mr. COCKS. Do you expect the sea to dry up eventually?

Mr. MOORE. Oh, yes; it will all be gone in a few years.

The CHAIRMAN. There is one further matter there which I understand is to be a subject of further consideration on your part.

Mr. MOORE. Which is that? The printing office? Yes, Mr. Chairman. But I have not answered fully the inquiry that Mr. Lever made about additional weather stations. I have before me 24 petitions from cities for the establishment of additional weather bureau stations. I will say that the most meritorious of them are, first, Fort Wayne, Ind.; Dayton, Ohio; Port Arthur, Tex.; and Miami, Fla. There are five places that I believe should have weather bureau stations. There are a number of other places here that ask for stations, with regard to which I can not give a favorable recommendation to the committee. But there are at least 5 out of the 24 that are meritorious.

The CHAIRMAN. There are five that you would recommend, with the good of the service only in view?

Mr. MOORE. Entirely so. There are a great many people who ask for them, and a great many want them.

The CHAIRMAN. You estimate that it would cost about \$20,000 to build and equip one of those stations?

Mr. MOORE. Yes, sir. I think you should erect the observatory hereafter whenever you start the station, and I will tell you why. The problem of whether or not the rainfall is changing, whether or not the climate is changing, in any part of the United States, is a very important one to the development of the region. Unless we have observations that have been taken during a long series of years in which the environment of the instruments remains practically the same, we can not answer those questions with that degree of precision with which we would like to answer them; and in order to have a long series of accurate data, from which deductions may be made in the interests of the development of the country, we do need to begin right now. The committee began right some time ago, but we should continue, and when we establish a new station we should buy the necessary ground around it and put a building there. Then we can control the environment of those instruments, and in years to come we will know that there has been no change in the rainfall or in the temperature due to a change of the altitude of the instrument or due to the building of high structures. When we exercise our authority and buy ground, we try to get into a location where, for a good many years to come, at least, there will be no such structures.

Mr. LAMB. You have a good place in Richmond.

Mr. MOORE. We have, indeed. They never can interfere with it.

Mr. McDERMOTT. Mr. Cline, of Fort Wayne, is here, Mr. Chairman.

The CHAIRMAN. I had expected to have Mr. Cline speak to the committee, but I think we had better finish with Prof. Moore first.

Mr. MOORE. I will say in regard to Fort Wayne and Dayton, Ohio, that Fort Wayne is outside of the distance limit. I aim not to come to the committee with a recommendation for a station within 100 miles of any other station unless the city has at least 75,000 popula-

tion. If it goes to that, its commercial interests are such that it is entitled to have the weather reports put before its board of trade and commercial interests just as soon as they are put before the Board of Trade of New York City. But for the small cities (and there are many of them clamoring for Weather Bureau stations) that are inside of the 100-mile limit, we do not favor the installation of Weather Bureau stations in those places. Port Arthur, as you know, is the terminus of a railroad that runs from Kansas City to Port Arthur. It is a great port and is a growing place, and they ought to have a Weather Bureau station.

Mr. McLAUGHLIN. If you will remember, I asked your opinion about a station at Ludington, Mich. I understood at that time that you favored that very much. You have not included that in those that you have turned down, have you?

Mr. MOORE. No. Ludington, Mich., is not on this list, and I will tell you why. There are hundreds of applications for stations in the files of the Weather Bureau. I have brought before the committee only those that have come in or that have been renewed since last January. Ludington, Mich., formerly had a full weather station. It now has a display station.

Mr. McLAUGHLIN. It is a very important point.

Mr. MOORE. I never have reported against Ludington, Mich.

Mr. McLAUGHLIN. It has an immense business. There have been some very disastrous storms there and there has been great loss as a result. If they had been forecast, probably there might have been a great saving.

Mr. MOORE. I have not reported against Ludington, Mich. These five, I say, are the most important. Ludington, Mich., would doubtless profit by a full Weather Bureau station.

Mr. LEVER. Just how are they the most important? Why do you recommend Fort Wayne, Port Arthur, Miami, etc., as the most important stations? Please give the committee your reason.

Mr. MOORE. I pick Fort Wayne and Dayton, Ohio, because of the size of the cities, largely, and their commercial interests; and Fort Wayne, because it is so far removed from any other Weather Bureau station that an observation there would be useful to us. We will go into even a small community and place an observation station there provided there is no station within one or two hundred miles of it, if the Government needs observations from that point.

Mr. LEVER. Fort Wayne is your first choice—that is, as far as the Government is concerned?

Mr. MOORE. Yes; Dayton, Ohio, is nearer to an existing station than Fort Wayne; but it is a large and important city.

Mr. CLINE. Permit me to say that Fort Wayne is now a city of about 70,000 population.

Mr. MOORE. Yes.

Mr. LEVER. Will you need reports from Fort Wayne to improve the accuracy of the forecast in that part of the country?

Mr. MOORE. Yes; reports from Fort Wayne would be useful to us in making forecasts for places like Pennsylvania and western New York. Several years ago, when you gave us authority to erect several Weather Bureau buildings (I think it was five, or seven; I have forgotten which), one of the first places with which we nego-

tiated with a view to opening a station was Fort Wayne, and the reason we did not put a station there was that we could not get the ground there for the money. We only had \$15,000, and the \$15,000 would not buy the lot alone.

Mr. BEALL. Have you any difficulty along that line now?

Mr. MOORE. We have to have more money.

Mr. LEVER. Where have you included the estimate for these five new stations?

Mr. MOORE. I have not included them. There is no estimate. These stations would be large stations. Instead of \$5,000, it would require about \$7,500 to maintain one of these stations at Dayton, Fort Wayne, and Port Arthur, because we would have to have three or four men in each of these stations. They would be large stations, you see. It would take about \$7,500 in addition to the appropriation for the building.

Mr. McLAUGHLIN. How near to Fort Wayne and how near to Dayton, Ohio, are your stations now?

Mr. MOORE. I do not know just exactly how far Dayton is from Columbus, Ohio. You can probably estimate it as closely as I can; but it is large enough to justify a station.

Mr. LEVER. Regardless of its proximity to some other station?

Mr. MOORE. Yes, sir.

Mr. LEVER. How far is Fort Wayne from Chicago?

Mr. McDERMOTT. It is 150 miles.

The CHAIRMAN. Is there anything further?

Mr. MOORE. I would like to say, if you decide to add in any amount for the construction of these stations, that you might consider whether or not you desired to erect buildings at the same time. If you should decide to put a building at Fort Wayne, we would need probably \$25,000 at least, instead of \$15,000, because of the greater cost of the ground.

The CHAIRMAN. If we agree not to authorize the construction of the buildings, an appropriation of about \$7,500 for each station would be sufficient?

Mr. MOORE. Well, we could rent quarters instead of erecting buildings, but we prefer, of course, to erect the buildings.

Mr. McDERMOTT. Have you ever located weather stations in Government buildings?

Mr. MOORE. Yes; we have a great many in Government buildings, but in many cases we have to get out of the Government buildings.

Mr. LAMB. Would not the authorities at Fort Wayne donate a site?

Mr. MOORE. That I do not know.

The CHAIRMAN. I expect Mr. Cline can answer that.

Mr. McDERMOTT. There might be some high building in Fort Wayne that could be utilized.

Mr. MOORE. We might get good quarters down town in Fort Wayne in one of the modern structures.

The CHAIRMAN. If there are no further questions, and if Mr. Moore has nothing further to present, we will excuse him now, and I will ask the committee to remain for the purpose of hearing Mr. Cline.

STATEMENT OF HON. CYRUS CLINE, A REPRESENTATIVE FROM INDIANA.

Mr. CLINE. Mr. Chairman, I only want to encroach upon the time of the committee for just a minute, because you have consented to let me present the matter at some other time. I would say that there is quite a mass of data which I would like to present when I appear before the committee. I am of the impression that if the committee would authorize Mr. Moore to construct a building at Fort Wayne, I could get the ground donated by the commercial interests of the city of Fort Wayne. I will take that matter up and will be ready to present data on that subject at such time as you kindly permit me to appear before you.

The CHAIRMAN. I will state to the committee that Representative Cline said to me a day or two ago that he desired to present this matter to the committee, but that he had not yet received the data that he needed in order to do so fully. I take it for granted that the committee would be glad to hear him at some future time. So if he prefers it, we will defer the whole matter until such time as he has the matter in such shape as he wishes.

Mr. CLINE. I will be glad to have that done.

(The committee thereupon (at 12.10 o'clock p. m.) adjourned until to-morrow, December 8, 1910, at 10.30 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Thursday, December 8, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott in the chair.

The committee thereupon resumed the consideration of the Agricultural appropriation bill.

STATEMENT OF MR. G. HAROLD POWELL, ACTING CHIEF OF THE BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE, ACCOMPANIED BY MR. WILLIAM A. TAYLOR, ACTING ASSISTANT CHIEF, AND DR. NATHAN A. COBB, IN CHARGE OF CROP TECHNOLOGY AND FIBER INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. In the regular course we should take up this morning the Bureau of Animal Industry, but Dr. Melvin, the chief of that bureau, is unavoidably detained on account of business which called him out of the city. I have therefore asked Dr. Powell, the Acting Chief of the Bureau of Plant Industry in the absence of Dr. Galloway, chief of that bureau, to appear before the committee.

It occurred to me that the most satisfactory way in which to take up the work of this bureau would be to ask Dr. Powell to present, first, a written statement of the work of the bureau on general lines and then question him later as to the details. He has been kind enough to do that, and I will request that the members of the committee allow him to proceed without interruption until he has concluded his statement.

We are ready to hear from you, Dr. Powell.

MR. POWELL. Mr. Chairman, I should like to briefly summarize the progress of several of the important lines of work of the Bureau of Plant Industry during the past year. It is difficult to separate one line of work from another, as it is not easy to say that any one is more important than another. I will therefore pick out representative investigations and present them as fairly representative of the work of the bureau as a whole.

PROGRESS IN PATHOLOGICAL INVESTIGATIONS.

SULPHUR SPRAYS FOR APPLE AND PEACH DISEASES.

The most important step that has been made in the treatment of plant diseases in the humid parts of the country since the introduction of Bordeaux mixture is the substitution of the sulphur sprays for Bordeaux. The Bordeaux is poisonous to many kinds of fruits, especially when growing. It has had a serious effect upon the apple, causing the fruit to russet to such an extent that commercial growers had become afraid of using Bordeaux mixture. This bureau has been foremost in the development and perfection of the sulphur-

spray combinations, with special reference to the eastern or more humid part of the United States, and their application to the apple and peach industries is epoch making in its importance.

The peach.—The peach industry from the Middle Western States eastward and southward represents about from 30,000 to 40,000 carloads per year. The estimated value of this fruit, at \$500 per car, is \$16,500,000. The estimated annual loss in the past from brown rot has been \$5,000,000; the estimated annual loss from peach scab has been \$1,000,000; or a total loss of \$6,000,000. The bureau has widely demonstrated this past year that 90 per cent of this loss may be prevented by the use of the self-boiled lime-sulphur treatment, which would mean an annual saving of over \$5,000,000 if all the orchards were properly sprayed. This treatment came into very general use in Georgia during the past year, as well as in other peach-growing sections of the Central West and in the East. It is not too much to say that the use of this spray has made the capital invested in the eastern peach business stable for the first time, and that the department work has given new life, new confidence, and faith to this industry in the entire eastern part of the United States.

The apple.—The lime-sulphur spray has been demonstrated by the bureau in the apple sections of Arkansas, Missouri, Kansas, Nebraska, and Virginia during the year, and a more general spraying, more thorough work, and the adoption of better methods in the production of fruit have resulted. The commercial apple crop has never been of as good color, as free from diseases and insects, and as free from russetting as the past year. This condition is attributed by growers and apple buyers primarily to the adoption of the lime-sulphur spray as a substitute for Bordeaux mixture. The work of the bureau along this line has had a far-reaching effect, not only upon the producer, but upon railroad companies, manufacturers, banking institutions, merchants, and others who are interested, either directly or indirectly, in the apple business.

THE BLISTER RUST OF WHITE PINE.

During the past year the blister rust of the white pine has apparently been brought under control. This disease has been located in importations in white-pine nurseries in 230 localities and wherever found has been destroyed. This has been accomplished through the cooperation of the bureau with the States involved. Assuming that this disease had become established and that not over 1 per cent of the trees had become infected, the loss to the white-pine industry would have been not less than \$1,800,000.

THE BARK DISEASE OF THE CHESTNUT.

One of the most striking effects of the work of the bureau has been noticed in the State of Pennsylvania during the past year in connection with the bark disease of the chestnut. A State-wide movement has been started in Pennsylvania to eliminate the disease from that State by using the methods worked out by the bureau, that is, by the cutting out and pruning of the diseased trees in the orchards and in the ornamental plantations and by the destruction of the few first infected trees when the disease begins to obtain a foothold in new localities.

PROGRESS WITH SPECIAL CROP PLANTS.

COTTON.

Texas big boll.—A good deal of attention has been given during the past year to the further improvement in the varieties of Texas big-boll cottons, which are increasing rapidly in popularity as far east as South Carolina, on account of the smaller cost of labor in picking and the smaller amount of damage to the cotton during wet weather. Two superior strains of big-boll cotton—the Lone Star, developed from a Texas big-boll stock, and an unnamed strain—have been developed in the past by the bureau, and during the year these strains have proved superior to the Triumph, the best of the big-boll varieties now in cultivation. The distribution of the seed of the Lone Star will be made this winter.

Durango cotton.—During the past year the Durango cotton imported from Mexico by the department in 1905 has been grown in the Imperial Valley of California, where this variety was planted for the first time. Experiments with this cotton attracted much attention, and it has already been locally proposed to substitute the Durango cotton for the upland varieties, which have been grown in the valley to the extent of some 15,000 acres in 1910. The Durango cotton grown in that valley shows fiber of unusual strength, of a length one-fourth inch greater than Triumph, which is an inch cotton; the yield is reported to excel that of Triumph, and the plants have a more upright habit of growth. This cotton may help supply the increasing demand for long-staple varieties. It is being improved in Texas for the purpose of securing a long-staple variety adapted to the Rio Grande Valley.

Long-staple upland cotton.—The bureau has also developed new early long-staple varieties of upland cotton, the best one being the Foster, which has given excellent results in northeast Texas and the Red River Valley of Louisiana, to be substituted for the old late-maturing long-staple varieties, which are being driven out of cultivation by the boll weevil.

Egyptian cotton.—The work on Egyptian cotton in the arid Southwest has made much progress during the year. The United States imported 11,500,000 pounds of Egyptian cotton in 1908 and 12,000,000 pounds in 1909, yet the investigations of the bureau show that an excellent grade of Egyptian cotton can be produced under irrigation in southern California and Arizona, where at least 600,000 acres of irrigable land are available for growing this crop. This cotton is very strong and is especially adapted to mercerization and to the making of fabrics in which great strength is required. In length it surpasses the ordinary American upland types (exclusive of the long-staple upland), but is inferior to the sea island types.

While in Egypt Dr. Cook made an extended investigation of the causes of variation in Egyptian cotton, and found that the deterioration in the crop of that country is due to a number of factors, including improper cultural methods, and especially to the mixing of the Hindi cotton with the true Egyptians, entailing a loss estimated at \$10,000,000 a year. This investigation has lent encouragement to the Egyptian cotton work of the bureau by showing that strains of Egyptian cotton can be bred in the United States which will not show the variation that causes these enormous losses in Egypt.

Three distinct types of Egyptian cotton have been developed by the bureau in the Southwest which are characterized by larger bolls, longer, silkier, and lighter colored fiber than the Mit Afifi, the standard commercial Egyptian variety. One of them, the Yuma, has been tested on a field scale in Arizona during the year, and yielded at the rate of one bale per acre. Sixteen bales of acclimatized Egyptian cotton, grown under the direction of the bureau during 1908 and 1909 on the Pima Indian Reservation in central Arizona, was sold last spring by the Indian Office to a large manufacturer at a price of 31 cents per pound, slightly more than twice the price of middling upland cotton on the date of sale. This cotton has already been spun with eminently satisfactory results. This has resulted in a large number of inquiries from mills that use Egyptian cotton regarding the possibility of the Southwest becoming the source of supply. Several thousand pounds of seed of the Yuma variety will be distributed to farmers during the present winter.

POTATOES.

In connection with our truck-crop investigations, the potato work stands out strongly. The varieties of potatoes at present used in the southern trucking sections are not altogether ideal, neither are all the commercial varieties adapted to the regions in the North in which they are grown. We have no preeminently disease-resistant varieties. In order to obtain better varieties, fitted for these special purposes, the bureau has produced and grown during the past year 30,000 new seedlings. These seedlings are based upon hybrids between our best American and European sorts, as well as between these sorts and other importations from Chile. These seedlings will be tested with a view to finding special varieties for different parts of the country, disease-resistant varieties and improved sorts for various purposes. This effort is undoubtedly the largest potato-breeding experiment ever undertaken. As a result of the bureau work in the potato regions, many of the extensive southern planters have been brought into contact with northern growers of high-grade seed potatoes, from whom they will secure their supply of seed direct rather than in the open market. This arrangement enables the southern planter to inspect the seed crop in the field for trueness to type and freedom from disease, two very important factors in the success of the southern potato industry.

THE RED PEPPER INDUSTRY.

During the past year the bureau has placed the Paprika pepper industry of South Carolina on a foundation where it should stand alone. The bureau has given directions to cooperators in the handling of about 50 acres of peppers. The crop of 65,000 to 70,000 pounds has been sold at 10½ cents per pound, resulting in a profit greater than that of cotton or corn. A great deal of interest has been developed in this work on the part of the farmers and spice grinders. The attention of the bureau will be given to the development of peppers used in the making of cayenne, as the demand for this type of pepper is probably 10 times that of the Paprika. We import between 4,000,000 and 5,000,000 pounds of red pepper annually.

THE DATE INDUSTRY.

Practically all of the best varieties of imported date palms have fruited at the gardens in Arizona and California in 1910. A study has been made of the methods of ripening dates, developed largely by the Arizona Station, and it has been found that in cool falls the valuable varieties, like the Deglet Noor, can be ripened artificially by subjecting the dates to a temperature of 115° for 48 hours.

Investigations are also being made of the methods of propagating the date rapidly, so that the fine seedling varieties, as well as the best of the imported sorts, may be disseminated more quickly than they have been up to the present time. Hundreds of thousands of date seeds have been distributed to growers in Arizona, Texas, and California, and these are being planted in the hope of breeding new types of dates even better suited to American conditions than those imported from abroad. Some of these seedlings, which have been planted only three or four years, produced splendid fruit during the past year.

There is a widespread interest in the work of the bureau in date culture in California and Arizona. A thousand people visited the bureau gardens this year. We are now importing nearly \$1,000,000 worth of this fruit and, in view of the favorable results at the bureau gardens, there is every indication that this industry can be commercially established in the desert regions of Arizona and California, where varieties are being grown superior to any now imported, and there is reason to feel that the use of dates may be greatly extended in this country.

PROGRESS IN THE STAPLE GRAINS.

The bureau has continued to give attention to the extension of the staple grain industry and to the working out of vital problems connected with the growing of wheat, oats, and other grains in different parts of the country.

WHEAT INVESTIGATIONS.

Durum wheat.—The durum wheat crop has now probably reached 50,000,000 bushels, 20,000,000 bushels of which were exported, and it is interesting to note, in view of the opposition which was made to the durum wheat during the first few years after its introduction, that for the first time the largest milling firm in the world has begun to advertise durum wheat patent flour and is making this a specialty.

The California wheat problem.—The wheat crop of California, which formerly amounted to about 40,000,000 bushels annually, has been steadily growing less during recent years, chiefly from lack of suitable varieties and improper methods of cropping. Millers of California have had to import from the middle Great Plains area nearly or quite half of all the wheat they grind to blend with their own wheat and thereby increase the quality of the flour. During the past year the bureau had studied more carefully and has extended the Chul and Fretes wheats, which were introduced from Turkestan and Algeria, and it seems probable that these varieties, which are adapted to the western semiarid country, will be a great stimulus to the California wheat-growing industry and should make it unnecessary for the Californians to import wheat in the future.

Extension of the winter-wheat area.—The bureau has also been prosecuting its studies in connection with the extension of the winter-

wheat area through the testing of the hardier strains of the Turkey and Crimean wheats, and during the past year it has seen the winter-wheat area extended still farther northward and westward, chiefly through the Kharkov variety, introduced from central Russia in 1900, of which there is now produced at least 20,000,000 bushels annually.

OAT INVESTIGATIONS.

Sixty-day oat.—It is interesting further to note that the sixty-day oat, which was introduced by the department about 1902, has been much more widely grown during the past year, and it has added to the safety and to the yield of the oat crop in the Central and Northern States through its freedom from fungous and insect pests on account of early maturity.

Swedish select oat.—The Swedish select oat, 20 bushels of which were introduced by the department from Russia in 1899, reached a production of 70,000,000 bushels during the past year, 50,000,000 bushels of which were grown in Wisconsin.

BARLEY INVESTIGATIONS.

A true beardless barley was produced during the past year by crossing Tennessee winter and Black Arabian, which ought to increase the value of barley as a hay crop and should give further value to this crop from the fact that it is likely to be winter-hardy.

THE STATUS OF THE COTTON STANDARDS.

Within the past year preparations were completed for the promulgation and distribution of the grades of cotton established by the department with the cooperation of representatives of the leading cotton exchanges and other organizations throughout the United States. About 200 sets of these types have been prepared and sets have been placed, for educational purposes, with each of the agricultural colleges in the cotton States and with a number of the leading textile schools and cotton exchanges. These sets are owned by the department and are subject to recall at any time. The sale of the grades began in September, since when about 50 of the grades have been sold. The cotton standards have been well received by the cotton industry, a large number of the leading cotton interests of the country having expressed themselves in terms of the highest praise. Twenty-five sets have been prepared for storage in vacuum, a method which is believed to be by far the best ever devised for the permanent preservation of standard cotton types.

PAPER PLANT INVESTIGATIONS.

Strikingly favorable results have been obtained from broom corn stalks as a raw material for book and printing papers. Good qualities of paper of different finishes have been produced from numerous varieties of corn. Both corn and broom corn have been found to yield under water extraction nearly the entire food value of the raw material, including proteids, and the further preparation of the pulp is facilitated by this removal. This food extract has been fed to animals for 30 days with such promising results as to call for a more extensive trial. The recovery of the food extract promises to be an

important factor in profitably utilizing many of the crop wastes for paper making. Laboratory tests have been made upon a large number of materials from which handmade sheets of paper have been produced.

INVESTIGATIONS IN THE HANDLING OF AGRICULTURAL CROPS.

One of the new lines that has been developing in the bureau within the past few years has been the investigation of the relation of the various methods of handling agricultural crops after production to their ultimate condition, and to the losses that take place through deterioration in their quality and grade. Until recently it has been considered by agricultural investigators that research in agriculture ought to apply primarily to the production of crops. The handling of a crop after it was produced was considered primarily a commercial proposition—not one that has scientific elements connected with it—and the crops have been turned over to commerce and trade.

It has been found by this bureau that the enormous losses, running into millions of dollars, that occur through deterioration in grain, cotton, fruit, and other agricultural crops are often primarily due to the development of diseases, to the rapid ripening of the products, or to other changes directly connected with their handling after they are produced. Therefore the bureau is undertaking to investigate the various factors connected with the handling of agricultural products, believing that it is the soundest type of conservation to hold in good condition the crops that the farmer produces.

FRUIT TRANSPORTATION, STORAGE, AND MARKETING.

Without entering into details, I would like to illustrate this type of work by referring to the citrus-fruit industry of California. The lemon and orange crops of that State now reach a total of more than 40,000 carloads annually. The losses during transportation from decay formerly varied from half a million to a million and a half dollars per year. These losses were supposed to be caused by the improper handling of trains of fruit by the railroads while in transit from the West to the East. Through the investigations of the bureau it was determined that the losses were primarily due to the improper handling of the fruit in preparing it for shipment, and this fact was clearly demonstrated to the industry through an extensive series of shipping experiments and of demonstrations extending over four years, with the result that the grower and the shipper have accepted the responsibility. The methods of handling the fruit have been reorganized in the groves and packing houses, at least three-quarters of the former losses have been eliminated, enormous plants have been erected by the railroads for the cooling of the fruit before shipment, and the relations existing between the growers, shippers, transportation companies, and the receivers have been greatly improved.

A similar line of work is underway with the citrus industry in Florida with equally promising results. It is also underway with the table grape shipping industry in California, which now reaches some 6,000 carloads annually, with results not less promising.

During the past year an extensive investigation was made of the peach industry in Georgia, and it was shown that by cooling the fruit

before it is started on its journey to the North the decay in transit can be eliminated and the geographical area over which the fruit was formerly shipped can be widely extended.

As a result of this type of work there has been a large demand on the department for the extension of its investigations to the fruit industries of the Western, Northwestern, and the Central United States, and to the Eastern United States. Several of the bureau specialists engaged in these investigations have been engaged by business interests.

GRAIN-HANDLING INVESTIGATIONS.

A similar line of investigation has been developed during the past year to determine the relation of the methods of handling the grain in the field to the changes that affect the grades. The methods of handling the grain in the field are under investigation, as are also the methods of stacking, cribbing, the question of the country elevator handling, of railroad shipment, and terminal warehousing, including the artificial drying, and the treatment during trans-Atlantic shipments. There is enormous loss in the value of the grain crop in the United States through deterioration that takes place in this crop after it is produced by the farmer. The investigations so far indicate that the present method of handling grain on the farm is one of the causes responsible for the condition of the grain when it is finally sold; that the condition of the grain when shipped determines in large measure the heating and the other changes that take place in it while in transit; that its condition on arrival in Europe is likewise due to the moisture content and other factors which enter into its condition when it is loaded in the steamer, as well as to the conditions under which the grain is stowed during the trans-Atlantic trip. This work has been developed somewhat on the same principles that guided the fruit-decay investigations, and it is believed in the end that it will not only assist in ameliorating the present difficulties that arise in the marketing of grain, on account of the variation in grade, but that, when the correct principles of grain handling are better understood, the difficulties that now arise will be gradually eliminated and an enormous saving will be effected.

THE NEED OF A COTTON HANDLING INVESTIGATION.

It is believed by the bureau that a larger increase in the value of the American cotton crop will result from a systematic study of the relation of the methods of handling cotton in the fields, in baling, in warehouses, during transportation, and at the terminal warehouses, to the changes that take place in the cotton, and thereby affect its grade.

The underlying motive of these investigations is to help the American farmer preserve the crops which he produces in the same condition in which he produces them. This type of work is capable of bringing enormous financial returns. The returns are susceptible of easy measurement, and the interest in the investigations on the part of producers, warehousemen, railroads, and others who are concerned directly and indirectly in the handling of farm products is an evidence of the soundness of this type of investigation as a matter of public policy.

PROGRESS IN THE WORK FOR THE PIONEER WESTERN FARMER.**EXPERIMENTS AND DEMONSTRATIONS ON THE IRRIGATION PROJECTS.**

During the past year the farms that have been established in co-operation with the Reclamation Service have been brought closer to the needs of the new settlers in the reclamation areas. Experimental farms are now established at Yuma, Ariz., where truck crops, alfalfa, and other crops adapted to the irrigated arid desert are being carefully tested; at Fallon, Nev., where cover crops, forage crops, garden and truck crops, tillage methods, and other plant subjects are being studied; at Umatilla, Oreg., where horticultural crops adapted to sandy land are being investigated; at Klamath, Oreg.; Bellefourche, S. Dak.; Williston, N. Dak.; Scottsbluff, Nebr.; and Huntley, Mont., where investigations with forage and grain crops, tillage methods, crop rotations, and other plant subjects adapted to each of these projects are under way.

DRY-LAND AGRICULTURE INVESTIGATIONS.

The investigations in dry-land agriculture have also been brought closer to the farmers of the Great Plains area through the dry-land and grain experimental farms. The past season was one of severe drought, with complete crop failures in some localities, except where proper methods of cultivation and rotation were practiced. Thirteen of these dry-land stations have been established—at Judith Basin and Huntley, Mont.; Williston, Dickinson, and Edgeley, N. Dak.; Bellefourche, S. Dak.; Scottsbluff and North Platte, Nebr.; Akron, Colo.; Hays and Garden City, Kans.; and Amarillo and Dalhart, Tex.; and grain and rice farms are established at Amarillo and Beaumont, Tex.; Crowley, La.; Nephi, Utah; and Moro, Oreg. The investigations at these stations are to determine the methods of tillage, of crop rotation, moisture conservation, in connection with the three staple crops, wheat, oats, and barley; the adaptation of other crops to the Great Plains area, and the improvement of crops already grown. The increasing interest in this work is manifested in many ways. The stations were visited by large numbers of people during the growing season in 1910, and meetings were held for the purpose of showing settlers the progress of the investigations.

DEMONSTRATION WORK OF THE BUREAU.

The demonstration work of the Bureau of Plant Industry continues to grow in favor among the farmers of the United States. There has never been as great an evidence of the usefulness of demonstration work as there has been in the various lines in which these methods have been applied during the past year. There are demonstration features connected with all of the leading lines of work in the bureau, but the following examples are given as representative of this line of activity.

FARM MANAGEMENT.

The study of the methods of farm management has been brought closer and closer to the farmers. In Michigan, Wisconsin, and other

Northern States the bureau has developed the fact that hairy vetch can be used profitably in rotation with other crops on the light, sandy soils of that section. In addition to that, it seeds remarkably well, which is a matter of great importance, as it gives the farmers a money crop possessing high market value, large quantities of seed being used in this country, practically all of which is imported at the present time from Europe.

An important contribution has been made to the study of the so-called abandoned farms of New York and New England, and it has been shown that by better tillage methods, the use of lime, clover, and improved seeds, many of these farms can be brought back into a state of high productiveness.

It has been shown by these investigations that an abundance of hay and forage can be produced on the poor sandy soils of the South, and that these crops in proper rotation will greatly improve the fertility of the soil.

FARMERS' COOPERATIVE DEMONSTRATIONS.

The largest piece of demonstration work in the bureau is the farmers' cooperative demonstration work in the Southern States. This work has been fully discussed before this committee in past years, but I desire to submit a table, which briefly summarizes the status of the demonstration work statistically under Federal funds:

Data regarding the farmers' cooperative demonstration work, December 3, 1910.

States.	Number of counties in State.	Number of counties having full time of 1 agent.	Number of counties having less than full time of 1 agent.	Total counties having demonstration work.	Number of agents.	Number of demonstrations listed December, 1910.
East Texas.....	55	20	15	35	33	2,151
West Texas.....	190	12	44	56	31	2,037
Oklahoma.....	75	16	21	37	30	1,533
Louisiana.....	60	19	18	37	45	2,478
Arkansas.....	75	39	11	50	54	2,734
Mississippi.....	79	9	44	53	47	991
Alabama.....	67	19	24	43	46	1,956
Tennessee.....	95		12	12	14	81
Florida.....	46	13		13	14	686
Total.....	742	147	189	336	314	14,447

States.	Number of cooperators listed December, 1910.	Total number of farmers directly instructed, 1910.	Boys instructed in corn clubs.	Funds expended, congressional appropriation.	Funds expended from local aid.
East Texas.....	10,869	13,020	10,241	\$26,000.00	\$1,187.50
West Texas.....	5,257	7,254		27,600.00	1,285.00
Oklahoma.....	7,742	9,075	5,242	25,000.00	
Louisiana.....	3,993	6,477	6,196	30,500.00	6,905.00
Arkansas.....	8,628	11,360	3,663	25,500.00	13,235.00
Mississippi.....	2,260	3,281	6,492	31,500.00	5,825.00
Alabama.....	3,199	5,155	2,254	30,500.00	3,300.00
Tennessee.....	218	299	1,685	10,000.00	
Florida.....	530	1,216		4,500.00	\$ 5,000.00
Total.....	42,730	57,177	36,273	212,100.00	31,737.50
General office and field project.....				38,055.00	
Salaries, statutory roll.....				8,920.00	
Total.....				259,075.00	

¹ Part of this list to be appointed.

² G. E. B.

The total number of farmers instructed under Federal and private funds in 1910 was 72,685. The total number of boys' corn-club members instructed during the year was 46,225. The estimated number of farmers to be instructed in 1911 is 90,000, while the estimated number of members for the boys' corn clubs for 1911 is placed at 60,000. These figures, however, give no conception of the interest that is constantly developing in these methods, which seek to bring about a better preparation of the soil, a better selection of seed, a wiser rotation of crops, and the introduction of new crops. They have stimulated a greater interest in agriculture on the part of the younger generation as well as on the part of those who are already located on the farms. The testimony of farmers, bankers, railroad men, and business men of various types during the past year seems to indicate that the demonstration work of the department in the cotton belt of the country is building not only a better agriculture at the present time, but that it is building wisely for the future in creating a stronger sentiment toward agriculture and a better agricultural practice throughout this entire area.

PEANUT INVESTIGATIONS AND DEMONSTRATIONS.

One of the most striking instances of investigation and demonstration combined is in connection with the peanut industry in Louisiana, Texas, Arkansas, and Mississippi. This work was started three years ago in an experimental way, and the peanut industry in those States has grown since then to 10,000 to 15,000 acres. The bureau has shown that the peanut is one of the most successful money crops that can be introduced into the boll weevil districts; that it may bring a gross return of from \$45 to \$90 an acre, can be handled in rotation with other farm crops and fits especially into a rotation of corn, cotton, and oats when planted in the fall and followed by peanuts in May or June. Largely as a result of the work of the bureau, a cleaning factory has been established at Shreveport, La. Several important concerns are buying peanuts in the territory; modern implements, which enable the peanut to be handled the same as any other extensive field crop, have recently been invented and are being introduced as the crop is introduced. Oil mills which have for years existed in this territory, but have been idle because of the diminished quantity of cotton seed, are very much interested in the peanut as a source of oil, and the oil from the peanut has been shown to be of high grade, having a quality similar to the higher grades of olive oil. It has also been shown that the cake left after the expression of the oil contains a higher percentage of protein than cotton-seed meal and that the hay is equal in value to the best clover hay. The interest in peanut culture throughout these States as a result of the bureau investigations and demonstrations is increasing enormously, and the bureau is receiving a large number of requests for investigational and demonstrational work along this line in the peanut areas from Norfolk, Va., southward.

PLANT INTRODUCTIONS.

The work in connection with the introduction of plants and seeds of economic importance has been greatly increased during the past year; 2,640 carefully selected introductions were made, coming from

60 different countries and contributed by over 200 foreign correspondents in out-of-the-way parts of the world. Our explorer, Mr. Meyer, is now visiting the oases in Chinese Turkestan in search of hardy drought and cold resistant fruits, grain, and forage plants. As he passed through Crimea and the Caucasus he secured a wild almond as a possible stock for stone fruits in dry regions; an alfalfa which is reported to be longer lived even than the Turkestan; an olive which has withstood a temperature of zero and fruited regularly; a remarkable collection of hard-fleshed edible grapes and Causasus cherries; and winter wheats from the oases of Samarkand, Old Bokhara, and Merv.

A wild peach, introduced from China in 1906, has proven remarkably hardy in Iowa and drought-resistant in the Southwest during the past year, and gives promise as a new stock for stone fruits.

A quantity of wild drought-resistant Palestine wheat has been secured during the present year for official experiments.

Fourteen of our collection of 75 mangoes have fruited in Florida, among them a late free-fruited variety of unusual importance.

The Chinese jujubes, drought-resistant fruit trees introduced in 1906, have fruited and indicate the probable value of this fruit planted as a cultivated orchard crop over a large portion of the dry-land area of the United States.

A 5-acre bamboo grove, containing the best timber bamboo of China and Japan, introduced in 1908, has been successfully established in north Florida, and a second planting made in Louisiana.

As soon as Mr. Meyer finishes his investigations in the Caucasus he will enter the western frontier of China (a section which no agricultural explorer has ever visited), which is the oldest irrigated agricultural region in the world. This region has many cities, some of which contain a half million people. Agriculture there is supposed to be highly developed, and Mr. Meyer will investigate the irrigated and dry-land industries with a view to introducing the best types of apples, pears, plums, and other fruits, corn, irrigated and dry-land forage plants, and other plants of economic importance.

LINEs OF WORK CLOSED DURING 1910.

I desire to report to the committee that several lines of investigation have been closed during the present year and the funds used in those investigations are being employed in similar lines under the same appropriations. For example, the little peach and yellows eradication test in New York; the investigation of the potato blight *Phytophthora infestans*; the gall disease of the daisy; the root rot of tobacco; the decay of cabbage in storage; and the cucumber fruit spot disease, have been closed. The pathological part of the rice blast investigations in South Carolina was finished. The Minneapolis and New York grain standardization laboratories were closed. The investigations of the improvement of sweet corn for canning and table purposes and the improvement and acclimatization of two strains of sweet corn for Florida, South Carolina, Maryland, and Connecticut were terminated. Some of the diseases of the sugar beet and an investigation of the by-products of sugar beets and a fungus infesting stored sugar were brought to an end. In the fruit investigations the study of the adaptability of early apples to the

Central Atlantic States, and methods of culture, and the orange-handling investigations of California have been dropped and the lemon-handling investigations are being brought to a close. In the drug and poisonous plant investigations, the investigations of the relation of plants to milk sickness in animals and the Paprika-pepper investigations are being terminated also.

That finishes the general account of the progress of the work of the bureau for the last year.

The CHAIRMAN. You remarked just before you closed that the grain laboratories in Minneapolis and New York had been discontinued. Will you give the committee the reasons why that should be done?

Mr. POWELL. It was found that the samples that were sent to those laboratories for testing for the character of the grain and for other purposes could be tested as well without carrying on so many duplicate laboratories in the field. Most of the grains that were tested in New York are now tested in the Baltimore laboratory or sent to Washington. The grains that were tested in Minneapolis are tested at Decatur, Ill., or Kansas City, Mo.

The CHAIRMAN. Are you able to report to the committee that there seems to be a more uniform system of grading throughout the country as a result of your work?

Mr. POWELL. I think without any question there is a much greater interest in grading, especially in the factors which enter into grading and the influence of the methods of grain handling on these factors. We see a considerable improvement in the character of the grades of corn in certain sections through better handling; and as the bureau brings about a better understanding of the factors which affect the grades we find in the grain trade, just as we found in the fruit trade, a very lively interest in that line of investigation.

The CHAIRMAN. There are some other questions I should like to ask in that connection, but perhaps I had better defer them until we reach that paragraph in the bill. Unless the members of the committee have questions to ask the doctor relating particularly to the statement he has just presented, we will pass to the consideration of the items in the bill.

SALARIES, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Turning first, then, to the statutory roll, I notice that you transfer one executive assistant in seed distribution—that is on page 21—from the congressional seed distribution, at a salary of \$2,250. I presume that person has been employed for a year or more at the same salary?

Mr. POWELL. Yes, sir; at the same salary. I might say, in connection with the statutory roll, that there are quite a number of changes made to conform to the law passed last year, requiring the transfer from the lump rolls to the statutory rolls of clerks and other employees below the grade of clerk. All of those transfers are made at the same salaries that the employees were receiving. There are only two changes in the statutory roll that are not due to simple transfers. One is an increase in the salary of an executive clerk from

\$1,980 to \$2,100. That is on page 21. Four clerks at \$900 have been substituted for six clerks at \$600, the amount of money involved being the same.

The CHAIRMAN. Let us discuss that. Will you give the committee the reasons why that executive clerk is recommended for promotion and the other two are not?

Mr. POWELL. This particular clerk is the one that has charge of the correspondence incident to the congressional seed work under the personal direction of the chief of the bureau—Mr. Oliver Jones. The reason why a proposed increase is made in this salary is because of the more exacting duties on the part of Mr. Jones and a great increase in efficiency on the part of Mr. Jones as he has become experienced in the bureau.

The CHAIRMAN. Has he any more authority or responsibility than the other two executive clerks?

Mr. POWELL. Yes; his duties are more exacting than those of the other executive clerk and of a different order.

The CHAIRMAN. How long has he been in the bureau?

Mr. POWELL. Since July 1, 1901.

The CHAIRMAN. Do you know how long he has served at the present salary?

Mr. POWELL. Since July 1, 1909.

The CHAIRMAN. Then the next change?

Mr. POWELL. The other change in the statutory roll is an executive assistant in pomology, at \$1,800. That is farther down, on page 21. That new position is proposed on account of the large number of changes that have taken place in the last year in this office and the increased responsibility on the part of the executive force. Several of the men in pomology have gone into private business, and it is necessary to place in that office an executive clerk carrying greater responsibility than in the past. This position corresponds to several other executive clerks of similar grade in the bureau.

The CHAIRMAN. In just what way does the withdrawal of the men you refer to involve this necessity?

Mr. POWELL. The putting on of a large number of new men in pomology has increased to a large extent the duties of the clerical force.

The CHAIRMAN. Is it proposed to promote some one who is now in the bureau to fill this place, do you know?

Mr. POWELL. That will be open to consideration by the bureau officials if the item is retained in the bill.

The CHAIRMAN. I did not know but that you were advised that some particular man would be put in this place.

Mr. POWELL. The probabilities are that a clerk already in the bureau will be put in that position.

The CHAIRMAN. But there is no such position now in the law?

Mr. POWELL. No; there is no such position now.

The CHAIRMAN. What is the next change?

Mr. POWELL. These are the only changes in the statutory roll, except those due to the transfer of employees from the lump funds to the statutory roll.

The CHAIRMAN. I think it is not necessary, then, to take any more time in considering the statutory roll.

GENERAL EXPENSES, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. We will pass now to the general expenses, page 25. In the first paragraph there, "For investigations of plant diseases and pathological collections," there is a slight increase proposed.

Mr. POWELL. I might say, Mr. Chairman, in connection with all of these increases that these increases are proposed to take care of the normal growth of the work in the bureau rather than to introduce new lines of work, with one or two slight exceptions, and that all of the increases which are noted in the different items provide for the extension or the development of lines of work already in progress.

The CHAIRMAN. Are there any paragraphs under this general head that you think more particularly demand an increase than the general ones?

Mr. POWELL. The increases of some are considerably larger than others on account of the greater amount of work, of course, under those items—if I caught the meaning of your question.

The CHAIRMAN. The idea I meant to bring out was whether you desired to make a special plea for any one of these items?

Mr. POWELL. No, sir.

The CHAIRMAN. Or whether you would let them all go together?

Mr. POWELL. All of them look after simply the growth of the bureau work, with the exception of a new item for the investigation and improvement of forage crops and methods of forage-crop production, at the bottom of page 25.

The CHAIRMAN. We will consider that when we reach it. Let us take this up first. I notice that your second paragraph, "For the control of diseases of orchard and other fruits," involves an increase of something like \$10,000. Has there been an unusual demand for that?

Mr. POWELL. A very large demand on account of the sulphur-spray work, the pear-blight work, and the black-rot disease of the grape. That \$10,000 is proposed to be distributed in increasing laboratory facilities—a small amount (\$500) for pear-blight investigations, \$2,000 of it for our general orchard-disease work, \$1,000 more for the spraying-demonstration work, \$1,000 for grape and small fruit diseases, and \$1,000 for citrus fruit work.

The CHAIRMAN. About how much did you spend this year for spraying demonstrations?

Mr. POWELL. I should have to refer to the records to answer that definitely.

The CHAIRMAN. If you have the allotment that you are making under this paragraph for the coming year, it will answer the same purpose. I just want to know in a general way about what proportion of this \$42,000 will be spent for demonstration.

Mr. POWELL. About \$4,000 has been spent during the past year and about \$8,000 will be used in general orchard-disease work this coming year.

The CHAIRMAN. In the third paragraph, "For the control of diseases of forest and ornamental trees and shrubs," there is an increase of about \$8,000.

Mr. POWELL. That is to place in each of three forest districts a forest pathologist to investigate the forest tree diseases in cooperation

with the district foresters of the Forest Service. The Bureau of Plant Industry investigates the diseases that cause losses in the forests. In conjunction with the Forest Service we have a pathologist at the forest products laboratory, at Madison, Wis., and one in California, in district No. 5. At the request of the Forest Service it is proposed that a pathologist be placed in district No. 1, at Missoula, Mont., one in district No. 2, at Denver, Colo., and one in district No. 3, at Albuquerque, N. Mex. The cost of each pathologist for salary and expenses will amount to about \$3,000.

The CHAIRMAN. To what extent is the work in regard to the control of diseases of forest trees done in cooperation or collaboration with the Forest Service?

Mr. POWELL. The Bureau of Plant Industry works out the life history of the diseases, the purely pathological features of the diseases, and the methods of controlling them. The control of the disease itself is in the hands of the Forest Service.

The CHAIRMAN. Under this paragraph you are not undertaking to exterminate insects?

Mr. POWELL. No.

The CHAIRMAN. Either in public or in private forests?

Mr. POWELL. No.

The CHAIRMAN. You are not spending any money for anything except merely to determine the best methods?

Mr. POWELL. To determine the methods and to work out the behavior of the diseases themselves. The Bureau of Plant Industry has nothing to do with any of the control problems.

The CHAIRMAN. I notice that you double the appropriation "For the control of diseases of cotton, truck, and forage crops, and related plants;" and you insert the words "and forage." Have you not been investigating the diseases of forage crops?

Mr. POWELL. Yes; but the authority for this work is in the bill in general. The item mentions "cotton truck crop and related plants." The words "and forage" were inserted to make the meaning perfectly clear.

The CHAIRMAN. You have been doing the work, as a matter of fact?

Mr. POWELL. Yes; we have been doing some work under this clause; but it was considered that it might be advisable to make that more specific on account of the great importance of the forage crops, as the other agricultural crops are specifically mentioned in the bill.

The CHAIRMAN. This is rather a long jump, from \$12,000 to \$24,000. Is there any particular emergency existing right now that seems to warrant it? The appropriation in the current law is \$12,960, and the amount asked for is \$24,860. It is a little less than double the amount.

Mr. POWELL. Of this increase \$3,900 is a transfer of the funds from the general plant-breeding item that are being used in disease-resistant breeding, and is not an increase in the total appropriation. It is proposed to use the increase in this way: Part of it for the further investigation of potato diseases—the wilt, the late blight, and the wart disease recently introduced from England; for the development of varieties of wilt-resistant watermelons for South Carolina and North Carolina; for the development of wilt-resistant cottons that are early maturing, and which are adapted to the boll-weevil terri-

tory; and a considerable amount in that connection is proposed to be used in cooperation with Dr. Knapp by putting a pathologist with his force to teach his demonstrators the underlying factors connected with the handling of cotton in the wilt areas. The rest of the increase is to be used in connection with truck-spraying demonstrations, in demonstrating on a large scale the methods of controlling the ordinary diseases of truck crops, such as tomatoes, cabbage, and sweet potatoes, somewhat as the spraying demonstrations have been conducted with the apple and the peach during the past year, practically no work of that type having been done with the truck-crop diseases.

Mr. LEVER. You have found no remedy for wilt except the wilt-resistant strain of cotton?

Mr. POWELL. Only by using the wilt-resistant Dixie variety.

Mr. HAWLEY. What forage crops have you specially in mind to investigate?

Mr. POWELL. The alfalfas, clovers, timothys, vetches, cowpeas, and other similar forage crops.

Mr. LEVER. Doctor, you do not make any study of the red spider, do you?

Mr. POWELL. No; that lies with the entomologist.

The CHAIRMAN. The next item is: "For investigating the physiology of crop plants and for testing and breeding varieties thereof," under which you ask for an increase of about \$8,000. I presume that it simply to extend the work along the same lines?

Mr. POWELL. That is to be extended along the same lines—date culture, fig culture, citrus-fruit breeding, the dry-land arboricultural investigation in the Southwest, and our cooperative work with the Indian agencies in the Southwest.

The CHAIRMAN. What more remains to be done with the date-culture work?

Mr. POWELL. There are two principal lines of work that need to be followed further. One is the investigation of the varieties in Nubia. We have reason to believe that there are many finer varieties there now than have been imported. Second, we need to develop more rapid methods of reproducing the date. At present the supply of date plants is secured from suckers, which grow from the base of the plant, and it takes from two to three or four years to get a sucker old enough to plant in the orchard. So if we start with only one plant of a promising variety, it may take a lifetime before there would be enough plants produced to put the variety on a commercial basis. It is proposed to establish at Indio, Cal., in connection with the date garden, a propagating house, in order that when the suckers are about 6 months old they may be taken from the plants and forced, through regular forcing methods. By taking them off when they are 6 months old the creation of new suckers is stimulated around the base of the plant, and it is believed that the rapidity of reproduction can be very greatly increased in that way.

The CHAIRMAN. Can not the date be reproduced from seed?

Mr. POWELL. Yes; but, like other fruits, it does not come true.

We have thousands of seedlings now growing in the Southwest, with the hope of finding a few that may be valuable commercial varieties.

Mr. HAWLEY. Can you graft the seedlings?

Mr. POWELL. No.

The CHAIRMAN. To what extent have date orchards been planted commercially?

Mr. POWELL. There are several commercial orchards planted in the Coachella and Imperial Valleys in California, and in Arizona.

The CHAIRMAN. Does the supply of American dates appear perceptibly in the market at all?

Mr. POWELL. Not yet.

The CHAIRMAN. For instance, are any of these varieties that you have brought to the committee to be found on the market?

Mr. POWELL. Yes; the Arizona station sold dates from its garden this year in the markets of the West, but the supply is not large enough to be found generally.

The CHAIRMAN. Have private parties put anything on the market?

Mr. POWELL. Not yet. The private parties are putting out date-palms as fast as they can get them.

The CHAIRMAN. How old must a palm be before it will bear?

Mr. POWELL. The sucker itself is about three years old before it is planted. The trees begin to fruit at three to four years after planting. I might say that the interest in the date business in the Southwest is one of the greatest interests in any line of the department's work at the present time.

Mr. LEVER. The date will not grow down in our country, in Georgia and South Carolina, I believe?

Mr. POWELL. No.

Mr. LEVER. Why not there? Is it too cold?

Mr. POWELL. It is too cold. There are only two or three places in the United States where the date will mature—in the hot desert countries of Arizona, California, and Texas.

Mr. LEVER. Does it require a dry climate?

Mr. POWELL. Dry and hot, and free from cold in the winter.

The CHAIRMAN. There is plenty of that kind of climate in Arizona, Texas, and California. If that is all they need, they ought to be a great success in this country.

Mr. HAWLEY. Will they not grow in New Mexico also?

Mr. POWELL. Probably not. It is not hot enough in New Mexico to bring them to maturity. I might say that even in the Coachella Valley and in the Imperial Valley some of the best varieties do not ripen when the falls are cool; and this last year it has been shown that the Deglet-Noor (which is the most valuable of the imported varieties) can be subjected to a heat of 115° for 48 hours and dates that would otherwise dry up rather than mature develop delicious quality.

Mr. HAWLEY. These Deglet-Noor dates here are artificially ripened?

Mr. POWELL. The samples before you are artificially ripened.

Mr. HAWLEY. By the process you have just mentioned?

Mr. POWELL. By submitting them to a heat of 115° for 48 hours.

The CHAIRMAN. Are the dates in the other box, which appear to be partially dried, those which have come as near as possible to ripening without being subjected to this process?

Mr. POWELL. Yes. This last fall was cool; and this variety, which matures late, would not have matured normally. You will find

those dry dates very edible. Three-fourths of the dates of the old countries are dry dates. We do not import the dry dates in this country.

The CHAIRMAN. Are those just as nutritious as the ripe dates?

Mr. POWELL. I understand so.

Mr. COBB. The Deglet-noor is the highest priced date that is sold. It is a light-colored date.

The CHAIRMAN. This is the Deglet-noor box; and these, I take it, are the dry dates?

Mr. POWELL. Yes; those that did not mature.

The CHAIRMAN. They will certainly stand transportation and exposure very much better than the ripened dates.

Mr. POWELL. Yes; very much. They do not have quite the high quality that the ripened dates possess. During the ripening this year from 50 to 60 people visited the gardens daily.

Mr. HAWLEY. Do you mean these were dried on the trees or dried after being picked?

Mr. POWELL. That was the stage of maturity which the date reached when it was picked. The Deglet-Noor grown in California, when ripened normally, is a higher grade date than the Deglet-Noor we import. The probabilities are that we shall develop from the seedlings already planted dates of Deglet-Noor quality which will be early maturing. Many of the fine varieties that we are now fruiting ripen normally in that climate.

The CHAIRMAN. Are the dates which ripen normally materially better in quality than those which are ripened artificially?

Mr. POWELL. I think any date that ripened normally would be better quality than those ripened artificially.

The CHAIRMAN. Passing to the next paragraph, "For soil bacteriology, plant nutrition, and water-purification investigations," you ask for a small increase of approximately \$3,000.

Mr. POWELL. That is to take care of the normal growth of the field and laboratory work under this item.

The CHAIRMAN. I notice that for the fiscal year 1910 there was turned back into the Treasury from this paragraph about \$2,500. Do you know how nearly the appropriation for this year will probably be expended?

Mr. POWELL. It will probably all be expended this year. Some of the money returned was due to employees leaving the latter part of the year. In some instances the work was not carried throughout the whole season.

The CHAIRMAN. "For acclimatization and adaptation investigations of cotton, corn, and other crops," and so on, you ask for no increase. Are you sure you will need all that you had last year?

Mr. POWELL. Yes; we feel that all of that will be needed, and can be wisely expended.

The CHAIRMAN. Have you an investigator in any tropical countries now looking after new crops?

Mr. POWELL. Not at the present time. Our only explorer at present is Mr. Meyer, who is in the Caucasus.

The CHAIRMAN. Is all the work which has resulted in the development of the samples of cotton you have brought here being done under this paragraph?

Mr. POWELL. Partly under this paragraph and partly under the drought-resistant paragraph.

The CHAIRMAN. In the next paragraph, "For drug-plant, poisonous plant, tea-culture, and general physiological and fermentation investigations," there is an increase of about \$7,000.

Mr. POWELL. That is distributed over the various projects under the drug-plant work, a small increase for the care of the several drug-testing gardens, a small increase for the camphor investigations in Florida, a small increase for work on volatile oil and perfumery-plant work, a small increase for the hop investigations in Oregon, Washington, and California, and laboratory investigations of drug and related plants; also small increase for the poisonous-plant investigations on the stock ranges of the West.

Mr. HAWLEY. What particular problems are you investigating in the hop work?

Mr. POWELL. The methods of curing hops, the development of new and superior varieties of hops, and cultural investigations which affect the yield and quality. This work is carried on in cooperation with some of the largest hop-growing interests in the country.

Mr. LAMB. What are you doing in tea culture? A Congress or two ago we were told that you thought you were through with that.

Mr. POWELL. We have very little work at the present time in connection with the tea industry, except that this last year a tea pruner was perfected for the pruning of the young tea plants; and that tea pruner has been thoroughly tested out in the South Carolina gardens.

The CHAIRMAN. Was that perfected by some private citizen, and patented?

Mr. POWELL. That was developed and improved by a department worker.

The CHAIRMAN. No patent has been issued on it?

Mr. POWELL. No; but steps have been taken to secure a patent, and the matter is well advanced. The patent will be public property when issued.

The CHAIRMAN. Approximately, how much do you expect to expend next year on tea culture?

Mr. POWELL. The tea work is carried in connection with a number of other problems as part of the project entitled "Miscellaneous investigations of drug and related plants." The total allotment for this composite project is \$2,180, of which less than \$2,000 will be spent on the tea work during the present fiscal year. No increase is asked for the coming fiscal year. The tea work will probably cost the department about \$1,900. The small remaining sum is used to bear the expense of preparing a series of bulletins compiled from various sources of information.

The CHAIRMAN. The Secretary has been calling attention for several years in his annual report to the fact that we import a great many drug plants which could just as well be grown here, and this committee has been making appropriations every year for investigations along that line. Have you any data that would give us any idea of the value of the work you are doing—of the increase in the domestic production of plants of that sort during the past few years?

Mr. POWELL. The most striking example of the growth of the drug-plant work is in connection with the camphor industry; and

following the department work there is being established an American camphor industry as rapidly as plants can be developed for planting in the field. The paprika industry in South Carolina seems to be established. Two large crude drug houses are taking steps to establish their own drug farms.

The CHAIRMAN. The camphor is in California?

Mr. POWELL. That is in Florida; and the bureau will plant this next year, from its nurseries in Florida, an acreage of 50 to 60 acres of camphor on an experimental commercial plantation.

The CHAIRMAN. A number of years ago, as I recollect it, Dr. Galloway reported that opium was being produced from the leaves of the poppy plant rather than from the flower. If I am right about that, do you know whether it has been followed up in a commercial way?

Mr. POWELL. Dr. Galloway reported, if I recollect correctly, that the alkaloids primarily obtained from opium are being sought in the walls of the poppy capsule. The success of this attempt would make it possible for us to do away with the importation of opium, and still secure to medicine the valuable remedial agents, such as morphine and codeine, at present derived from imported opium. This work is still experimental.

The CHAIRMAN. In a general way, though, you can say that the American production of drug plants has materially increased during the past year?

Mr. POWELL. It has increased; yes, sir. The interest in it is increasing rapidly on the part of the drug manufacturers, those who have to import, and on the part of agriculturists, as shown by the pepper industry, which is included under the drug-plant work.

The CHAIRMAN. "For crop technological and fiber-plant investigations," you reduce the appropriation.

Mr. POWELL. The reduction is due to the transfer of people from the lump fund to the statutory roll. It is not a reduction in the working fund.

The CHAIRMAN. Just what do you mean by "crop technology," and how does that subject happened to be coupled with fiber-plant investigations?

Mr. POWELL. May I ask Dr. Cobb to answer that question? He is in charge of the technological work.

Mr. COBB. That term, "crop technology," as used in the bill, covers investigations of the crop after the farmer has grown it, and before it has reached the manufacturing stage. Our paper-plant investigations and our fiber investigation and our cotton-grades investigations are good examples of that; also, the grain standardization. We are gradually changing that term to "agricultural technology."

The CHAIRMAN. What do you do under the term "crop technology" that is not done by the men who are looking after the handling of the crops as involved in the grain-grading paragraph and others of that character?

Mr. COBB. Of course the manner of growth of many plants and the uses to which they are put are determined very largely by the factors that occur when they come to be manufactured, and our effort in these lines of work is to make the farmer acquainted more than he has been in the past with what the manufacturer wants, and also to inform

the manufacturer of the farmer's situation, so that he may on the one hand help the farmer by suggestions, and so that on the other hand he may not ask of the farmer impossibilities, which has frequently been the case in the past.

The CHAIRMAN. Does that apply to all farm crops? For instance, is the manufacturer of starch to instruct the grower of potatoes, or the manufacturer of flour to correspond with the grower of wheat? Or is it limited simply to the manufacturer of fiber and his relations with the man who grows the plant?

Mr. COBB. It has been most strongly developed, Mr. Chairman, in connection with the fibers that are dealt with under this item that we are considering and the grain standardization.

The CHAIRMAN. I was trying to figure out the connection between crop technology—which seems to be a very broad term, if I have any comprehension at all of its meaning—and fiber-plant investigation, which is a very limited term.

Mr. POWELL. The reason that fiber-plant investigation is included in that item is that Dr. Cobb happened to be an expert along those lines and the two items were combined for administrative purposes.

The CHAIRMAN. That is clear, then. That helps us out. Have you done anything in fiber-plant investigation during the past year?

Mr. COBB. Yes, sir. One of the most important lines in connection with that work has been the development of farms at the Florida Keys for the growth of plants which produced sisal. We import \$14,000,000 worth of sisal from Yucatan every year. It is practically a Yucatan monopoly. The effort has been to discover locations in this country where that plant can be grown. We are guided in the selection of the Florida Keys by the fact that a very thriving industry has grown up in the Bahamas during the last 10 years, the exports from the Bahamas last year being £40,000 in value. The Keys present something like 100,000 acres of land which is now not used at all, and is very similar to that where the sisal is successfully grown in the Bahamas.

The CHAIRMAN. Is that land all privately owned?

Mr. COBB. I could not tell you the full extent to which it is privately owned. At the place where the cooperative experiments are carried out it is privately owned.

The CHAIRMAN. And you are simply instructing the farmer in the growth of the plant?

Mr. COBB. Yes. We have a cooperative station there, at which we are carrying out the same class of culture that is carried out in Yucatan.

The CHAIRMAN. Has any effort been made to introduce the manila hemp into this country?

Mr. COBB. No serious efforts have been made to introduce that plant into this country. About the only places where it could be tried with prospect of success would be in Porto Rico and Hawaii; and even these are a little too far north. Experiments in Porto Rico have not proved successful, and though the results in Hawaii are more promising, no serious efforts to introduce the plant on a large scale have been justified.

The CHAIRMAN. As a matter of fact, that particular variety of the abacá plant is grown only in the Philippine Islands, is it not?

Mr. COBB. There are stray plants elsewhere, but not on any large scale in the United States or its possessions other than the Philippines. They have begun, however, to grow it in Java.

The CHAIRMAN. "For investigating the handling, grading, storing, transportation, and baling of cotton," etc., you cut the appropriation about \$3,000. Is that due to a transfer to the statutory roll?

Mr. POWELL. That is due to transfers to the statutory roll.

The CHAIRMAN. You add the words "storing" and "transportation."

Mr. POWELL. That is to make the authority specific to determine the relation of all of these methods of handling cotton to the changes which affect grade.

The CHAIRMAN. That is along the line to which you referred a while ago?

Mr. POWELL. It is along the line of fruit and grain investigations to which we referred.

The CHAIRMAN. I suppose the work of establishing standards for the different grades of cotton has been practically completed; has it not?

Mr. POWELL. I will ask Dr. Cobb to tell you about it, as he has charge of the work.

Mr. COBB. The official grades for white American cotton have been completed and promulgated, and have been well received by all branches of the industry. We have had practically no hostile criticism, and one may almost call it a chorus of approval from all branches of the industry. This map shows the present distribution of sets of these grades, being about 80 sets at the present time. The sale began in September. This was in accordance with the recommendation of the committee appointed by the Secretary. The grades have been adopted by three of the large exchanges of the country.

The CHAIRMAN. What exchanges?

Mr. COBB. The New Orleans, the Memphis, and the Natchez exchanges.

The CHAIRMAN. And the grades named in their contracts have been made to conform to these grades, have they?

Mr. COBB. Yes, sir.

Mr. LEE. Did you mention New York in this statement?

Mr. COBB. No, sir. New York is considering the matter, as are a large number of the other exchanges. But naturally the change to a new system of grading is not a thing that a cotton exchange can undertake very hastily.

Mr. LEVER. How does Liverpool regard your work?

Mr. COBB. We have no official communication on the subject from the Liverpool Exchange. A number of members of the Liverpool Exchange have seen copies of the official grades. So far as I know they have all complimented the manner in which the grades are prepared and indicate that most of the grades, especially middling and above, would probably prove suitable abroad. Below middling they express the opinion that there are some decided differences that might perhaps meet with disapproval of the European exchanges and cotton trade.

The CHAIRMAN. Have you sold all the samples that you have parted with, or have you sent some out without price?

Mr. COBB. We issued about 40 sets at first, as to which we used the term "placing." It might be called a loan; but they are the property of the department and will be recalled if they are not ultimately adopted by the exchanges where they are placed. I am not certain whether a recall will take place in the case of the agricultural colleges, which may be considered to a certain extent as Federal institutions. Where these have been placed, they have now begun to be purchased. Several of the exchanges where they were placed, having adopted the grades, have now purchased the sets. So I may say that about half of the sets issued have been sold.

The CHAIRMAN. How many sets did you say had been issued?

Mr. COBB. About 40 have been placed as described and about 40 have been sold.

The CHAIRMAN. How many have been made up?

Mr. COBB. We have made up about 200 up to the present time.

The CHAIRMAN. You have had no call for them?

Mr. POWELL. They have been on sale only since September.

Mr. COBB. They have been sold right along since September.

The CHAIRMAN. They are being sold, you say?

Mr. COBB. They are being sold right along, but not rapidly.

The CHAIRMAN. To cotton merchants?

Mr. COBB. More largely to manufacturers than to anyone else, but they are sold to all classes.

Mr. LEVER. Are the farmers' organizations buying them?

Mr. COBB. No, sir. The farmers' organizations, however, are getting the benefit of this work by the official grades being privately copied, which is a very good thing so long as it is well done. No doubt the sale of these grades has been much less than it would have been had the price been lower, the law requiring that the sets be sold at cost, and we are now taking into consideration the issue of an abridged set. We have taken the greatest pains to have these passed upon by experts from North and South, so that there should be no question in any part of the industry as to these grades being actual good copies of those submitted by the original committee, and we have met with no criticism on that score. But of course that makes them expensive.

The CHAIRMAN. What did you find that they cost, as a matter of fact?

Mr. COBB. They cost us \$35 a set to issue to put on board in Washington. That makes them cost at least \$10 more after the express is paid to a point as far away as Texas. In fact, one man out in California has paid over \$20 express on his set, bringing the total cost of that set up to \$59. We are now considering the issue of abridgments, which can not, of course, be called an official set, but which will serve an important purpose among those who would not feel that they could pay \$35.

The CHAIRMAN. What can that be sold for?

Mr. COBB. That could be sold for about \$5, putting relatively the same amount of care upon it that is put upon the official sets.

The CHAIRMAN. You spent a good deal of money last year, and no doubt will require to spend some this year, in connection with this matter, which it seems to me would not need to be expended next year. What do you think about that?

Mr. COBB. We anticipate coming out very nearly even this year. It is expected that the demands for the sets will grow, and there is every indication that it will do so. Our estimate has been exceedingly conservative, and all the money from the sales returns to the Treasury, so that, in fact, the fund is not expended as other funds are, but is a revolving fund. There is one thing that perhaps would not occur in connection with this item—the placing of these standards in vacuum. That is an expensive operation, but we consider it absolutely essential so that the standard shall not change from year to year. Our system will enable us to put these away in such secure storage that they can be taken out 50 years or 100 years from now, or, as far as we know, 1,000 years from now, in the same condition that they were put in.

The **CHAIRMAN.** My recollection is that this item as it stands in the present law included \$25,000 for the manufacture of these sets of grades. It would certainly seem, in view of the slow demand for them, that you would not need to spend \$25,000 for making up sets this year, even if no money came back from those that you are supposed to sell.

Mr. COBB. We have estimated that we shall require in the neighborhood of \$7,000 to \$8,000 to put these specimens in vacuum storage. That item cuts a deep gash in the appropriation.

The **CHAIRMAN.** And yet it leaves about \$15,000?

Mr. COBB. We feel that enough sets should be kept on hand to supply the prospective demand. The cotton used in making up the sets has to be secured by the employment of high-class experts.

Mr. McLAUGHLIN. What do you mean by “putting them in vacuum?” Do you keep them so, or only while they are in your possession? Do you put them up in some kind of a receptacle?

Mr. COBB. It is essential that our originals be preserved without change. To this end we have devised a system of vacuum storage. For storage in vacuum a set of grades is prepared in boxes in the usual way, but with a sheet of paper about 1 inch below the surface of each type. The surface alone shows the grade. This 1 inch of cotton is rolled up in the paper and slipped into a glass tube about 3 inches in diameter and 12 to 15 inches in length. The paper protects the cotton from light, and asbestos is placed in each end of the tube to further protect it from light and from the heat used in sealing the tube. The air is then exhausted with an air pump three times in succession, at intervals of a day or two, and the tube sealed by fusing the ends. The sample is thus preserved so as to be free from the action of air, light, and moisture, and our carefully conducted experiments show that when the tube is broken and the sample carefully unrolled the surface of the cotton presents the same appearance as when it was placed in vacuum.

When a set of official grades is prepared in this way it exists in 108 large glass tubes. These are stored in darkness until required. They are not used while in the glass vacuum tubes. These are simply storage tubes to keep the cotton from undergoing any change that would alter its grade. Of course, if we have no way of keeping our originals from changing, we are certain to get into difficulties sooner or later. This is an important matter, and we consider the vacuum-storage device one of the best pieces of work we have done in this connection. The permanency of the vacuum-storage originals

is a fundamental improvement in cotton grading. Fifty years from now we can have the same standard by simply breaking open one of the sets of vacuum tubes.

Mr. McLAUGHLIN. Do they go in that shape to the public?

Mr. COBB. No. That is a frequent misconception, and one that readily arises in connection with this matter. These that are placed in the vacuum are simply for use in making up new standards in the future. We have a set like this, for instance, from which we make up our new sets for issue. That deteriorates; it gets dusty; and it has to be exposed to the light when we are comparing and making a new set; and it gradually changes on account of the action of the light and has to be replaced. We can make it last, by various devices, a year or two years. Now, what are we going to do? If we have not placed some of the copies of this set under such conditions that they can not change, the system breaks down. After a few years we would be varying from the original standard. But having put away, say, 25 sets like that in these tubes—each set requiring 108 of these tubes—we can take them out annually or at such time as we like, break the tubes, replace the cotton in the boxes, and go on making copies and be sure that we are working on the same standard that we began with. That is a very important matter.

Mr. LEVER. What is the life of one of those samples [indicating a box of official grades]?

Mr. COBB. It depends altogether on how it is used. We have good evidence of sets having been issued that in three months' time would have gone off sufficiently so that their utility would be seriously diminished.

Mr. LEVER. Then of what value are these grades to the cotton trade when they deteriorate so much?

Mr. COBB. They are of very great value if they are treated in the proper way. Every box bears full instructions as to caring for the contents. Most of the exchanges, at least, understand how they should be kept; and the sets we send them are immediately sealed up, or rather they make copies first. They are then immediately sealed up and put into a vault, and are taken out only on the signature of some important committee and for the purpose of making new copies or adjusting their copies that are in use.

Mr. POWELL. Their normal life to an exchange would be one or two years, would it not?

Mr. COBB. Yes. Sometimes, under good conditions, they would last four, five, or even six years; but that is rare.

Mr. LEVER. In the case of an ordinary cotton merchant using them in the cotton trade and dealing with the farmer directly in buying his cotton, it seems to me that the system breaks down if the samples sometimes do not maintain themselves for more than three months, as you say.

Mr. COBB. That depends altogether on how they are used. Of course, if they are used carelessly in three months' time they will not be as good as they were in the beginning. If great care is taken to close the box immediately after you are through using them they may be used daily and last for a year or two.

Mr. LEVER. Why could not those grades be put under glass?

Mr. COBB. There are very serious objections to that. I think for the farmer's use there might not be such serious objection as there is

to using the grades where important decisions and arbitrations take place. The reflections on the surface of the glass interfere seriously with judging the cotton accurately. Then, again, you would have to be careful that every glass was of the same color and the same thickness. And there is the danger of breakage. The glass has to be kept clean, and in cleaning glass it gets scratched. The glass would add very much to the weight. There are many serious difficulties. It has been tried out many times, but has been abandoned time after time. Another objection is that the pressure of the glass gives an artificial surface. We have here in the official grades a surface that is perfectly natural. That cover does not press on the grades at all.

Mr. LEE. Let me ask you this question. You say it costs about \$8,000 to preserve these samples in tubes. It would no doubt be proper to do that if these grades had been adopted over the country; but it is an experiment, is it not?

Mr. COBB. We have been cautious there. We have not yet put these into vacuum. We feel that it would be better to have a larger number of exchanges officially adopt these grades before we enter on that expenditure. But we fully expect that to take place this year. That is, we have now three important exchanges that have adopted the grades. It might be thought advisable to expend this \$7,000 or \$8,000 for vacuum purposes on that basis. We would prefer, however, to first see one or two other exchanges officially adopt the grades.

The CHAIRMAN. Do you wish to have us understand that this \$8,000 will be an annual continuing expense as long as the samples are kept in vacuum?

Mr. COBB. No, sir; On the basis of the expenditure here we have thought that 25 sets would be about the right proportion for this year. A good deal of thought and canvassing convinces us that if these sets are adopted as widely as they bid fair to be adopted the demand will be very large. We know that the number of sets of one kind and another actually in use runs into many thousands and they have to be renewed from year to year. If it should appear next year, for instance, that the demand was going to be what we anticipate it will be, we should want to increase that 25 to 50 or even 100. One reason for that, apart from the necessity of the Government possessing a sufficient number of permanent copies, is that we have already had inquiries as to whether we will supply these vacuum sets. You see how important this will be, for instance, if this standard is adopted by the whole world, a thing which we, from the Secretary down, feel is a very desirable thing and which it is not too much to say may take place. It would be very important that these vacuum sets should exist, not only in this country, but elsewhere; and our inquiries with regard to these vacuum sets have come from abroad as well as from this country.

The CHAIRMAN. As you know, the theory upon which this appropriation was made in the first place was that this \$25,000 would constitute, in effect, a revolving fund.

Mr. COBB. Yes, sir.

The CHAIRMAN. That the Government would receive back the cost of these samples. It seems to me that if you place the sets (as you say you have done) in the various exchanges without any limitation as to the time they may remain, you will sell very few of them.

There will be no object for an exchange to buy a set which it can have the use of without purchasing it. It would rather seem to be a business proposition to have them placed there with a definite limit of time, so that the exchange will either have to pay for them or return them.

Mr. COBB. No definite limit has been set upon the time, but with every set that has been so placed a letter has been sent saying that the time will expire; that is to say, there is no intention that these sets shall remain indefinitely in the possession of these exchanges, and they will be recalled inside of the present fiscal year. In fact, we are already contemplating issuing warnings that the exchange or other institution shall either adopt them and buy them or return them. Of course it was necessary in some way to make the cotton industry familiar with the official grades. Placing the sets as we have done was considered the best way to initiate the sale. These advance sets were educational. Our idea has been that this fund should be administered in such a way that if there is any balance left over it will be returned to the Treasury. Financially we are in good condition, and no portion of this item has been expended for any other purpose than for putting up sets of grades up to the present time, except a small sum of about \$600 devoted to further studies looking toward improving the quality of these grades.

Mr. HAWLEY. Is it not possible that upon their return some of these sets you have sent out will be found to be useless, as a result of having been exposed to the air?

Mr. COBB. That is a possibility; yes, sir. In some cases, I think, it is a probability. However, assuming that there has been no radical abuse, but merely that they have gotten dusty, we can renew them at a very slight cost. We have developed a special method for doing that.

The CHAIRMAN. I believe you said you had made up about 200 sets of these samples?

Mr. COBB. Yes, sir.

The CHAIRMAN. At an average cost of \$35, which would mean that you had expended thus far about \$7,000 of the \$25,000 that was appropriated for your use along that line this year?

Mr. COBB. Yes, sir.

The CHAIRMAN. Do you expect to expend the remainder of the \$25,000 in making up additional sets of samples during the remainder of the year?

Mr. COBB. We have gone cautiously in that respect, Mr. Chairman, because we did not wish to get caught with a large amount of this work done and a larger number of sets on hand than there is demand for. We have had no indications that the demand will not continue; in fact, quite the contrary. Nevertheless, we have kept just enough ahead so that we could be well prepared for even any abnormal increase of the present rate of sales. That is the reason that we have bought the cotton for 1,000 sets.

Mr. HAWLEY. How many of these 200 sets have you sold?

Mr. COBB. The actual number sold at the present time is 43.

The CHAIRMAN. I thought you said that right around 40 was the total number placed?

Mr. COBB. No, sir; double that.

Mr. POWELL. There are 40 sold and 40 placed in addition.

Mr. COBB. We have placed about 40 and sold about 40.

The CHAIRMAN. So that you have now on hand in the neighborhood of 100 sets?

Mr. COBB. No, sir; we have more than that, considering the vacuum sets.

The CHAIRMAN. You have already put away 25 vacuum sets, have you?

Mr. COBB. Yes, sir; set them aside for vacuum storage.

The CHAIRMAN. And it is your expectation to keep that number in vacuum?

Mr. COBB. Yes, sir. We have on hand (if you wish the exact figures) 90 sets for sale, also 25 sets for vacuum storage, and 338 single boxes of grades which are not yet made up into sets. We do not necessarily make up 9 different grades at a time. We may make up 50 middlings, and so on. This statement shows all that is so far placed in the boxes and still on hand.

The CHAIRMAN. How much of the appropriation of \$25,000 have you expended up to date? Can you tell us?

Mr. COBB. We have expended up to date for material and freight, \$4,368; for salaries, \$3,776; on experiments in connection with length of staple (which is one of the most important and successful lines of our work in this project), \$666, almost exclusively for salaries. This latter is the only portion of this fund that has not been expended directly on the production and distribution of the grades. We therefore have an unexpended balance at the present time of \$26,174.

The CHAIRMAN. How much of that is in the \$25,000 fund? How much did you say had been expended from the \$25,000?

Mr. COBB. These figures are based on the allotment for this project, which includes also—

The CHAIRMAN. For the entire project?

Mr. COBB. Yes, sir; which includes also the handling.

The CHAIRMAN. Will you give me again the figures as to the amount you have remaining in this fund?

Mr. COBB. The unexpended balance is \$26,174.

The CHAIRMAN. Can you give the committee an estimate of the amount you will probably turn back at the end of the fiscal year?

Mr. COBB. We began with an order list for \$5,000 worth of the grades. On issuing notice to these people that the grades were ready, we found that a large number wished to cancel their orders. There were definite orders, sometimes accompanied by money, which, however, we had returned, up to such time as the sale began, namely, last September. The policy of the department, however, has been not to force the grades on the industry, but to make it a thing that grows out of the actual demands of the cotton industry, and with its fullest approval, so that all those people who wished to withdraw their orders were given the fullest permission to do so.

Mr. HAWLEY. What reasons did they allege for withdrawing their orders?

Mr. COBB. The most frequent reason was the price of the set—\$35.

Mr. HAWLEY. How much did they usually remit when they remitted with the order for the set?

Mr. COBB. \$35—the price that we had set.

Mr. HAWLEY. Then they were advised what the price would be?

Mr. COBB. Oh, yes; they were advised by press notices what the price would be long before the sale began. No doubt many either did not notice the price or forgot.

The CHAIRMAN. If an unofficial set can be produced and put on the market for \$5 (which I understood you to say is a good thing), is it not likely that such sets will supply the demand and that your official sets will remain in cold storage?

Mr. COBB. Of course we have no hesitation about the official sets that are put in vacuum storage, and of course they will not go into vacuum storage until we know a little more fully than we do now that the thing is going to be a country-wide affair. All exchanges, chambers of commerce, etc., will require full sets. Very many brokers, dealers, and mills will require full sets. Probably only farmers and small dealers will buy abridgments.

Mr. HAWLEY. How many grades are there in the official set?

Mr. COBB. Nine.

Mr. HAWLEY. Just the same as in this small box?

Mr. COBB. Yes. In answer to your question, Mr. Chairman, I will say that we have been careful not to put up any more sets than would keep us well ahead of the orders, so that we have a good deal of the cotton pretty nearly as we bought it in bales; and of course that amounts roughly to so much cash in hand, barring the fact the Government does not insure. With regard to the demand for these, I will say that I have information that a set similar to this abridgment shown here, but in all respects very much inferior to it, has sold to the extent of \$18,000 worth. I understand this was during the last year, though I am not positive about the length of time. But as it was first brought out something like 18 months ago, I presume that it is within the last year. As I say, this set, privately issued, and based, so far as it can be done, on the official standard, as I understand it, has sold to the extent of \$18,000 worth.

The CHAIRMAN. At \$5 a set?

Mr. COBB. They charge a dollar a grade, and supply any number of grades required.

Mr. HAWLEY. What is the difference between the official set and this smaller set?

Mr. COBB. You see, there are 9 grades here in this abridgment in one box, one type each, from middling fair down to good ordinary. In an official set of 9 boxes the middling fair box alone would contain 12 types, showing the variation that middling fair cotton can have, a very important matter. So also you will have 12 different kinds of good ordinary cotton in the good ordinary box, and the effort in the official grades—and no doubt the most successful effort of the kind that ever was made—was to place in each original box 12 different good representative types of cotton of that particular grade.

The CHAIRMAN. The purpose of my questions was to draw out your judgment as to whether an appropriation as large as that you have this year is actually needed for next year.

Mr. COBB. I think, Mr. Chairman, that it would be wiser to have it that way, for this reason: There is every evidence that this project will grow. We have no evidence to the contrary. If the money is not used, it is turned back into the Treasury. It gives us the necessary funds on which to act. There is no knowing when we shall need

them. If to-morrow the New York Exchange should adopt those grades, it would increase the sale very rapidly, as I know from the inquiries that we have had. Many people, such as northern mill superintendents, have said, in making inquiries: "When this exchange adopts these grades, we shall want them." Many of them have bought them regardless of that.

The CHAIRMAN. The money that you receive for the grades is turned directly into the Treasury?

Mr. COBB. Yes, sir. We do not get it back, Mr. Chairman.

The CHAIRMAN. Are there any further questions along this line? If not, we will not continue the inquiry any longer this morning. The time has come to adjourn.

(The committee thereupon took a recess until 2 o'clock p. m. of the same day.)

AFTER RECESS.

(At the expiration of the recess the committee resumed its session, Hon. Charles F. Scott in the chair.)

CONTINUATION OF STATEMENT OF MR. G. HAROLD POWELL, ACTING CHIEF, BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE, ACCOMPANIED BY MR. W. A. TAYLOR, ACTING ASSISTANT CHIEF, BUREAU OF PLANT INDUSTRY, AND MR. NATHAN A. COBB, IN CHARGE OF CROP TECHNOLOGY AND FIBER INVESTIGATIONS, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. Dr. Cobb, I believe you remarked before the committee adjourned this morning that there was one other matter that you would like to bring to our attention, in connection with the matter of cotton standardization.

Mr. COBB. Yes, sir. Apart from the very conclusive evidence that exists on the last pages of the series of papers, of which you all have a copy, that Congress acted very wisely in passing this law, I should like to draw attention to a development which will call for expenditure under this head; and that is our studies of the length of staple. That is a most important matter in connection with the cotton industry from one end to the other, and from the grower clear to the manufacturer. More disputes and more arbitrations and more expense occur in connection with that item than any other in the whole cotton trade. It amounts to very large sums annually. These arbitrations are naturally very expensive. Of course, these grades, as established, are the grades as they could be agreed on by representatives of the cotton trade, and are such as the exchanges now use in their contracts. But these grades do not take any account of the length of the staple or the strength of the staple; and, of course, those are really the most important factors.

The CHAIRMAN. Pardon me for interrupting you: Have the length of the staple and the strength of the staple ever been considered factors in the grading of cotton commercially?

Mr. COBB. No, sir; except in connection with what would perhaps not ordinarily be called "grading," but really is grading—I refer to the trade on marks. Many firms establish a mark for a certain class of cotton, and they sell it year after year under that mark—

usually letters and numbers, "B—H—1," we will say. A company establishes a grade known as "B—H—1." That "B—H—1" does take account of the length and strength of the staple. If a factory orders that "B—H—1" from that firm year after year, the firm stands behind it, and guarantees that it has the same qualities year after year; that is to say, the same strength and the same length, as well as the same grade, using the term in its more common meaning.

Mr. HAWLEY. Do I understand that a low grade of cotton may have the same length of staple as the highest grade?

Mr. COBB. It might have; yes, sir. As a matter of fact, the lowest grade of cotton might have a higher value than the highest grade, simply on account of the length and strength of the staple. That would not usually occur, of course; but it is possible.

Mr. POWELL. In other words, the grades are based upon the appearance of the cotton and the amount of dirt rather than upon the intrinsic worth of the cotton at the present time.

Mr. HAWLEY. I should like to ask one further question. You make your study of the length and strength of the fiber or staple for the purpose of improving the length and improving the strength of the fiber?

Mr. COBB. That is the way in which the results of our investigations will be used in other divisions of the bureau, but not in our division.

Mr. HAWLEY. That would be the ultimate purpose of it?

Mr. COBB. That would be one purpose—one of very many. I assure you this is a very important matter. We have found a practicable method of determining the length of staple. It is the first time such a thing has been done, and our results are absolute. Cotton men who have seen it all agree on that and exhibit the keenest interest in the fact that we have discovered a method of giving the absolute average length of the staple. Of course that being the case, it becomes possible to introduce into grading, making these official grades the basis, this valuable quality of length. And I am ready to say that we are very hopeful indeed on the other score—that is, of getting a method by which the strength can be practically determined for this purpose. But with the matter of length we are beyond the experimental stage.

In order to make this perfectly evident, I am showing you here a tabulation of the results of some of our experiments. This tabulation shows in one column the estimates (or, as we know them to be, the almost pure guesses) of experts throughout the cotton industry. Growers, dealers, and manufacturers have given us samples of cotton, with their best judgment as to the length of the staple. We have applied to those samples, as handed over to us, our test, which gives the absolute length of the staple.

The columns on these papers marked "Inches" give you the results of some of our measurements, and give also the full range of our results. The first column gives in inches the actual length of the bulk sample of cotton submitted to us—say a pound or several pounds. The second column gives in inches the expert's estimate of the length. You must remember that these are all recognized experts, some of them men who spend the whole day throughout the year doing nothing but judging cotton, at high salaries. They are men of that class.

The difference between those two columns is very marked. You will see that at the top the differences are a fourth of an inch and at the bottom of the column they are a sixteenth of an inch. In other words, they rarely have got, with our samples, nearer than a sixteenth of an inch, and they average over an eighth of an inch off, and not infrequently they do not get within a quarter of an inch of the actual average length.

The CHAIRMAN. I notice that they almost universally overestimate the length.

Mr. COBB. Yes, sir.

The CHAIRMAN. Is that to the advantage of the spinner or the grower?

Mr. COBB. It depends on the way the trade is going; or, as they sometimes put it, "which side you are playing on." In spite of the fact that they are unable to gauge the length of the cotton, nearly everybody in the trade who gets to the grade of these men is a past master in "drawing" a sample one way or the other. They can take a sample and draw it long or draw it short; and, of course, if you are selling you draw long and if you are buying you draw short.

The chairman, Mr. Scott, calls attention to the fact that they all estimate too high. That looks on the face of it as if it might perhaps be all right, because if they all go the same amount higher what difference does it make. But that it is not the case. As a matter of fact, in this list the same man figures both near the top and at the bottom.

The CHAIRMAN. Evidently, then, he was trying to give an honest judgment.

Mr. COBB. Yes, sir.

The CHAIRMAN. And the difference simply represented the element of error.

Mr. COBB. That is right.

The CHAIRMAN. Which is eliminated by your machine?

Mr. COBB. That is right.

The CHAIRMAN. But there is one other question which I should like to ask in that connection. You stated that by further development you thought you would be able to introduce the length of staple as a factor in these grades. I also understood you to say, in response to Mr. Hawley's question, that a sample of cotton which is graded very low under the present system might have a longer and a stronger staple than a sample of higher grade.

Mr. COBB. As now graded.

The CHAIRMAN. Suppose that when you apply your mechanical test it should be shown that a sample of cotton that you have put in your sample box as representing the lowest grade as a matter of fact has a longer and better staple than one which you have placed there as representing the highest grade, would you change the places of those samples in any way?

Mr. COBB. Roughly, I should answer "yes." But, of course, at the present time, as no effort is made to introduce the staple factor, except to say that all these grades must be spinnable cotton—they must have what we call fair average staple—the idea would be that the lower grades would contain the shorter and the weaker staple. That is, other elements would be introduced into these grades beyond the

color and dirt, as is now the case. We do not pretend yet to say just in what way it would be best to introduce it. Our policy in this matter is to consult the cotton trade. It is probable that it would be best to let these grades stand as they are and on the basis of this method to quote the different grades at definite lengths of staple. You could quote middling cotton inch and an eighth, middling cotton inch and a sixteenth, and so on.

The CHAIRMAN. That is a matter of detail that you have not yet worked out?

Mr. COBB. Yes, sir.

The CHAIRMAN. Is it or is it not a fact that around the same cotton seed there may be cotton fibers of widely different lengths?

Mr. COBB. That is true.

The CHAIRMAN. Then, when you take a bale of cotton and attempt to fix the length of the fiber, will you not have in that bale fiber that runs all the way from the minimum to the maximum in length?

Mr. COBB. Yes, sir.

The CHAIRMAN. Then, commercially, how do they judge it?

Mr. COBB. There are other factors that produce the same result. Take the matter of ginning. If it is badly ginned, even long-staple fiber will shorten up so that it may become short-staple fiber. There you simply come to the average. There is no expectation that we shall ever get cotton in any given sample all of one length of fiber, but, of course, we are approaching that. Our other divisions in the Bureau of Plant Industry that are engaged in breeding cotton will also utilize this work. As you will see, they are attempting to bring about the state of things which is shown in the sample that Mr. Powell has just brought out here.

Mr. POWELL [producing sample]. There is a Mexican cotton whose characteristic is having the length of staple uniform. It does not shade off from short staple to long staple on the same seed.

The CHAIRMAN. Then the experts who are engaged in this business now, in determining the length of staple, simply take a bunch of cotton and shred out a number of fibers, and try to find that which is shortest and that which is longest and make an average?

Mr. COBB. The method is to take the cotton absolutely as it comes.

The CHAIRMAN. How much more money do you expect to spend along that line next year than you will spend this year?

Mr. COBB. We ought to spend a good deal more, if the project develops as we have every reason to expect that it will. We have been very cautious so far. We did not engage in this work at all until about the time our sales began in September. As far as the sale of the grades is concerned, it is only a couple of months old.

Mr. BEALL. Right in that connection: The sale began after the cotton season was under way?

Mr. COBB. Yes, sir.

Mr. BEALL. The sale of cotton begins, say, the 1st of August in a certain section. In my part of the State it is in full blast by the 1st of September; and probably if those grades had been on the market sooner there would have been a much greater demand for them.

Mr. COBB. In that matter we followed the recommendation of the committee which was called together by the Secretary, which advised that they should not come into use before the 1st of September of this year.

The CHAIRMAN. Is there anything further that you desire to offer?

Mr. COBB. I was only going to say that we have been very cautious in this matter. We had not begun this work until we were quite sure that the grades were going to "take." As I have said before, the evidence is before you here of what the cotton trade think of it. That will account for the low expenditure thus far along those lines. We believe that the expenditure along this line should be very materially increased. In this we are supported by all the cotton people whom we have consulted; and we have consulted them very freely.

The CHAIRMAN. Have you had charge of the work that would probably come under the words "storing" and "transportation?"

Mr. COBB. Yes, sir.

The CHAIRMAN. How much money have you probably devoted to that this year?

Mr. COBB. A comparatively small sum; the salary of one man and his expenses, probably not running to over \$3,000.

The CHAIRMAN. Do you expect to increase that any during the year?

Mr. COBB. Yes, sir. We consider that one of the most important lines of the work, as Mr. Powell indicated in his opening statement.

Mr. LEVER. Just what do you hope to do on the line of storage and transportation?

Mr. COBB. As you probably know, there is a very great loss in the cotton trade due to the careless way in which the cotton is handled from the very beginning. If these grades were better understood by our farmers, they could pick the cotton and have it ginned in such a way that the bales of cotton in this country would be more like the bales of wool in Australia—only one grade in a bale; whereas there are now two or three, and the farmer always gets the price of the lowest one. He does not get the price of the highest one. Then we expect to take it from that point right through the handling and make a careful study of the whole thing. We already have a number of studies in one report indicating what improvements can be made, and indicating how the matter should be taken up. The amount of loss along this line is variously estimated at from ten to twenty millions of dollars per year in this country—the actual losses in cotton through bad handling and bad baling.

Mr. LEVER. That is very important work.

Mr. COBB. It is very important. Mr. Powell laid special stress on it in his opening statement.

Mr. POWELL. Those words were put in there to provide for an extension of the work during the coming year along that line, as under the authority contained in the item we did not feel justified in extending the work largely.

Mr. COBB. Another important point is this, Mr. Chairman, if I may make one more remark: We already have good evidence that the committee has not completed its work. Two important exchanges have brought forward what was brought up at the committee meeting itself—that while the law provides for grading cotton, it makes no specific provision for "stains" and "tinges" or anything else, and it was thought that the committee would act wisely not to take up at that time stained and tinged cottons. Two of the most important exchanges in the country are agitating this question; and if I were not here to-day, it is probable that I should be in New York

consulting with the president of the New York exchange on that point. We have the example of foreign exchanges, which already have grades for tinged and stained cotton. Perhaps it is not necessary for me to say what those are. But we have the evidence that the people in this country want it, and that all the foreign exchanges adopt that system in buying our cotton. It seems to us that in handling this project the Secretary should have it financed in this way, so that if it is necessary—as it is probable that it will be—to call this committee together again in order to perfect what they have begun, he will have the money with which to do it.

The CHAIRMAN. If the law does not cover the preparation of grades for stained and tinged cottons, how would you expect to do any work along that line?

Mr. COBB. There is a question, of course, as to the interpretation of the law. I will say that at the meeting of the committee which the Secretary called together the interpretation put upon it was that it apparently was not the intention that the committee should go outside of white cotton. But the law does not specifically state that the Secretary shall confine himself to white cotton. So that it might become either a matter of interpreting the law or further action by Congress.

The CHAIRMAN. It seems to me that it was clearly the intention of Congress that you should make up samples which would represent the different grades of the entire cotton crop of the United States. If a part of that crop is composed of stained and tinged cotton, I do not know why you would not be authorized to take it into account as well as the rest. But that is my personal opinion only.

If you have nothing further to offer, and no members of the committee have any questions to ask, we will proceed to the next paragraph, where I notice there is an increase of about \$6,000 requested "for investigating the handling, grading, and transportation of grain." Mr. Powell, can you give us a reason for that increase?

Mr. POWELL. That, Mr. Chairman, is for the purpose of extending the investigations of the methods of handling grain in the field, in country elevators, while in transit, and during the other processes of handling, and their relation to the changes that take place in the grain and which affects the keeping quality and the grade. The work is in progress along those lines; but there is so much interest in it and so many requests to the department for an extension of the work that it seems advisable to extend it considerably.

Mr. HAWLEY. Would that include an investigation as to the time of the cutting of the grain?

Mr. POWELL. Yes; the effect of maturity of grain, the relation of the methods of handling corn with different moisture contents to its ultimate condition; the influence of the methods of stacking grain in the field, of cribbing, and of various other factors which enter into field handling.

Mr. HAWLEY. Will that be confined to corn, or extend to all grains?

Mr. POWELL. To all grains. I was using corn as an illustration. We wish to investigate the behavior of grain in elevators that has been handled in different ways in the field, so as to get at the fundamental reason for the heating and changes that take place in elevators; the behavior of grain handled in different ways in the field

when it enters into transportation, either in cars or steamships, to foreign countries; and the relation of the methods of handling grain in the field and in transportation to its behavior after it reaches a terminal market. At present the widest variation in condition can be found in 20 different lots of corn received from the same section, some of it reaching the destination overheated and other lots in various condition. Most of the troubles of this kind are not understood. They are laid to improper transportation facilities, terminal facilities, elevator handling, or various other things that enter into the handling of the grain. We believe that by determining the factors which influence the condition or the grade the farmer will have information that will help him in handling his corn or wheat or other grain, so that the highest condition of the grain when cut may be maintained and not be seriously injured by the various methods of handling.

The CHAIRMAN. What you have just said illustrates very well the extent to which what appeared in the beginning to be a very modest little matter may be magnified and carried away from the purpose that primarily was in the mind of the Congress. I think that when this provision was first inserted in the bill the Member who drew it and the other Members who after much persuasion permitted it to remain in the bill intended that the principal work done under it should be that of discovering, if possible, new and better ways for grading grain, with the idea of establishing eventually a uniform system of grading. Complaint was made that wheat which graded No. 2 in Minneapolis was graded No. 3 in Chicago and No. 4 in New York, or that the grading was reversed in other markets. This discrepancy was felt to be injurious to the commercial interests of the country and to be due to the numerous standards of grading, all independent of each other. It was thought that possibly the Department of Agriculture might be able to devise some means, mechanical or otherwise, by which the same cargo of grain would be given the same grade, whether at Duluth or Chicago. My recollection is that most of the work of the department for the first two or three years was directed along that line. I remember that Dr. Galloway was quite enthusiastic once about a little mechanical contrivance that had been devised by some one in the bureau to rapidly determine the moisture content of grain, and I think that last year when he came before us he was on the trail of some sort of an electrical device that would determine that matter more rapidly than the one they had used the preceding year. But it seems from what you have said that you are gradually getting away from that, or, at least, that you are now following some other branch of the work.

Mr. POWELL. I should say that we are supplementing the former line of work by investigating the fundamental factors that enter into the grades of grain rather than getting away from it, as we are not letting up in any way on the activities which the chairman has just described.

The CHAIRMAN. The fact that you had closed your laboratories at Minneapolis and New York rather gave me the idea that you were somewhat letting up on those activities, and I was going to ask you whether that was the case; and if so, whether it was because you thought you had accomplished all you could?

Mr. POWELL. We feel that it is not necessary to maintain as many laboratories as formerly. Therefore we closed one or two of the field laboratories and may think it advisable to close one or two more and have concentrated the force. We believe that the determination of the physical condition of grain samples as sent in by the trade can be done from this time on at our Washington laboratory, at the Baltimore laboratory, at New Orleans, and possibly in one western laboratory; that it will not be necessary to maintain this large number of duplicate laboratories for the purpose of testing for the trade the samples of grain sent in, as they can be sent to these other laboratories just as well. This is especially true now, as the grain inspection departments in practically all of the terminal markets have established their own laboratories to make determinations of moisture and other things with methods worked out by the bureau. These commercial laboratories keep in close touch with our own.

The CHAIRMAN. Before you leave that subject, let me ask you whether the demands from the trade are increasing or diminishing?

Mr. POWELL. They are increasing steadily. Fifteen thousand samples of grain were examined last year.

The CHAIRMAN. What do you do? You simply grade samples that are sent to you, do you, and issue a certificate?

Mr. POWELL. We determine the amount of moisture in the samples of grain sent in, the amount of broken material, the amount of dirt, or such other factors as are considered in fixing the grade, and give those results to the trade.

The CHAIRMAN. As the result of all this work, do you think there is now any more uniform system of grading throughout the country?

Mr. POWELL. As a result of this work there has been a decided improvement in the uniformity of grading, and the rules adopted by the National Grain Dealers' Association, very largely as a result of investigations carried on by the department, are now in use by practically all of the principal grain exchanges throughout the country.

The CHAIRMAN. Do the exchanges now pretty generally make a mechanical test of the moisture content?

Mr. POWELL. Yes; that is coming into very general use among the exchanges, and many of the smaller grain dealers and shippers also make moisture tests. One company which uses 40,000,000 bushels of corn in manufactured corn products purchases all of its supply after moisture determination.

The CHAIRMAN. What instrument do they use for that?

Mr. POWELL. The oil method, as worked out by the bureau. A year ago 600 of these machines were in use in the trade.

The CHAIRMAN. Your electrical apparatus did not develop anything practical, then?

Mr. POWELL. Not so far. It is still in the experimental stage.

The CHAIRMAN. Has the same man been in charge of this branch of the work ever since it started?

Mr. POWELL. The scientific side has been in charge of the same man. Mr. Shanahan, who was a practical grain inspector and who was particularly interested in practical grain-grading questions, has been in charge of the work as a whole up to this time. Mr. Shanahan is now leaving the department to engage in business.

The CHAIRMAN. Has the elimination of a number of laboratories been due to a change in personnel, bringing with it a different judg-

ment of the necessities of the case, or has it grown out of experience which has shown they were not needful?

Mr. POWELL. It has grown out of experience, which has shown that it was not necessary to maintain all of those laboratories after the trade began to establish laboratories for the same purpose and had been instructed in department methods and that the funds used for the maintenance of those laboratories could be used in studying the fundamental factors which enter into grades to better advantage to the producer and to the grain trade in the end.

The CHAIRMAN. So that the problem which you now regard as important under this paragraph is that of safeguarding the quality of the grain from the farm to the ultimate consumer?

Mr. POWELL. I consider that one of the most important factors in connection with the whole grain-grading problem—to determine, first, the factors which do enter into grade, in so far as that is affected by the changes that take place in the grade due to handling. I would not consider that to be a problem which ought to crowd out the other lines; but that ought to be one of the most important lines to supplement the grain-grading studies up to the present time, because this latter line strikes fundamentally at better agricultural practice, and at better methods of grain handling.

The CHAIRMAN. Have you there a project book that will give us your estimate of the division of this sum among the various subheads?

Mr. POWELL. Yes. Approximately \$5,282 will be used in the general supervision of the work; \$17,613 will be used in an investigation of the methods of handling grain on the farm, at the shipping points, and at terminal and export markets; \$16,902 will be used in a study of the transportation and storage of grain; \$12,269 will be used in the commercial grain-grading investigations.

The CHAIRMAN. Are there any further questions?

Mr. HAWLEY. Do changes occur in grain after it is put in the elevators?

Mr. POWELL. That depends on the condition in which the grain goes into the elevator. If it has a large moisture content, very decided changes may take place.

Mr. HAWLEY. Does it make any difference whether the elevator is made of wood or made of cement?

Mr. POWELL. That is one of the projects now under investigation in Baltimore, where the changes in corn in cement and in wooden elevators are being studied.

Mr. HAWLEY. You have not arrived at any conclusion?

Mr. POWELL. Not yet. We have grain in these different types of storage plants at the present time and are studying the shrinkage and deterioration that takes place.

The CHAIRMAN. Now we will pass to the next paragraph, "For physical investigations in connection with the various lines of work herein authorized" a small increase is asked. Just what does that paragraph mean? In what way are whatever physical investigations may be needed in connection with the various lines of work herein authorized excluded by the language of the respective paragraphs? In other words, what is the need for this general-authority paragraph here?

Mr. POWELL. The investigations under that paragraph are concerned with physical studies connected with the different lines of

work in the bureau and not conducted in any other office separately. With the dry-land investigations the physicist, in cooperation with that investigation, measures the climatic conditions that modify the growth of the crops, such as the relation of the moisture content of the soil to plant growth. We are testing, for instance, the cultivation and crop-rotation methods and studying the relation of those to evaporation and to losses of moisture from the soil. They are physical investigations primarily connected with plant changes. They are physical investigations primarily connected with the agricultural side of dry-land farming.

The CHAIRMAN. Is the word "physical" there interpreted to relate to the science of physics?

Mr. POWELL. Yes, sir. The item was based very largely upon the work of an investigator who is a physicist; so the word "physical" was placed in the item primarily for that purpose.

The CHAIRMAN. Do you see any good reason why all the work that you have described could not be done under the language of the various paragraphs and paid for from the appropriations made in those paragraphs?

Mr. COBB. It could be, Mr. Chairman, if it was desired to employ physicists in each office.

The CHAIRMAN. For example, when we make an appropriation to carry on certain work in dry farming, does not that appropriation cover all work that may be deemed desirable in connection with that experiment?

Mr. POWELL. It might be; yes. But there are a great many different similar physical investigations required by different offices, and this office is used for the purpose of doing those things that are needed by different offices, rather than to expend the money for specialists in each one of those offices as a unit.

The CHAIRMAN. This is really, then, to carry on the expense of a physics laboratory?

Mr. POWELL. Yes.

The CHAIRMAN. Including the salary of a physicist?

Mr. POWELL. The physics work needed by the various offices in the bureau is localized in that office. There is practically no investigational work carried on in that office except in connection with the crop-growing work of the different offices.

The CHAIRMAN. I understand. Next, "To collect, purchase, propagate, test, and experiment with seeds of interest to agriculture," etc., a reduction is recommended of some \$3,000.

Mr. POWELL. That is because of the statutory changes.

The CHAIRMAN. That is due to transfers to the statutory roll. Otherwise the paragraph remains the same as the present year?

Mr. POWELL. Yes, Mr. Chairman.

The CHAIRMAN. "For studying and testing commercial seeds," etc., you ask for a slight increase.

Mr. POWELL. That is to provide for greater laboratory facilities and for natural increases of work in the seed-testing laboratories.

Mr. HAWLEY. Were any of the employees in this particular work transferred to the statutory roll?

Mr. POWELL. Yes; two.

Mr. HAWLEY. So the increase is greater than appears here?

Mr. POWELL. The actual increase for that work is \$2,500.

Mr. HAWLEY. That remark would probably apply to a number of these other items?

Mr. POWELL. Yes.

Mr. HAWLEY. The increase is larger than it would appear on account of the transfer of employees to the statutory roll?

Mr. POWELL. Yes.

The CHAIRMAN. "For the investigation and improvement of grains and methods of grain production," you request an increase of how much?

Mr. POWELL. An actual increase of \$17,000. That is to provide for the extension of a large number of projects carried under the grain investigations, to be distributed somewhat like this: One thousand dollars for the increase in laboratory facilities; \$2,000 for the study of the effect of environment on the composition of grain, which is being carried on in cooperation with the station in Tennessee and independently in California; \$2,000 for an increase in the investigation of cereal diseases; \$1,500 for an increase in the studies of the dry-land sorghums; \$2,000 for an increase in the oat investigations, the production of more of the hardy winter oats; \$2,500 for an increase in the rice investigations in California, Louisiana, Florida, and Texas; \$1,200 for an increase in the maintenance of grain-testing farms in Texas, Oregon, and Utah; and \$5,000 distributed over the various corn projects.

The CHAIRMAN. What are your corn projects, briefly?

Mr. POWELL. Briefly, the corn projects are corn breeding, or the selection and improvement of types for higher yield; cultural studies such as the methods of planting in hills, of growing, and fertilizing, and a series of studies on the methods of curing sweet corn. Those comprise the main projects. I will enumerate all of them if the chairman would like to have them.

The CHAIRMAN. That is not necessary. That gives the committee an idea of what they are. Just one more question: You have asked for an increase of how much for the dry-land experiment farms?

Mr. POWELL. \$1,200 for the dry-land cereal farms.

The CHAIRMAN. How many of those do you maintain?

Mr. POWELL. We have one at Amarillo, Tex.; one at Moro, Oreg.; one at Nephi, Utah; a rice-farm at Crowley, La.; one at Beaumont, Tex.; and work in cooperation with the dry-land agricultural investigation with many of the States.

The CHAIRMAN. Are these lands owned by the Government?

Mr. POWELL. These lands are sometimes owned by the experiment stations, and we work in cooperation with them. They are sometimes owned by the communities and are leased to the Government.

The CHAIRMAN. Why will it cost more next year than it does this year to maintain them and operate them?

Mr. POWELL. Because of the increase in the work on those farms. They are used as centers of investigation for other offices of the bureau. That makes a little higher cost of maintenance, and a little higher cost of labor. The \$1,200 increase provides for an increase of \$300 or \$400 per farm in maintenance. It is largely a matter of maintenance charges.

Mr. LEVER. I want to ask Dr. Powell what progress he has made in his rice-blast investigations?

Mr. POWELL. We have been working on the pathological side of the rice-blast investigation; we are growing varieties to find immune kinds. The work is very largely to get a better idea of the disease itself. We are asking for an increase of \$2,500, to be able to put into field tests the result of our laboratory studies.

Mr. LEVER. You have not discovered any remedy for that disease?

Mr. POWELL. Not yet.

The CHAIRMAN. Passing to the next paragraph, you ask for an increase of some \$4,000 "for the investigation and improvement of tobacco," etc. I notice that you change the phrase a little bit. Does the new wording give you authority to do any work that you think you have not the authority for now?

Mr. POWELL. It makes the authority a little stronger on the side of the methods of handling tobacco. The same principle is involved there that we have been discussing with grain and the other crops. The increase asked for there, Mr. Chairman, is \$1,500. While there is an apparent increase of some \$4,000, \$2,900 of it is a transfer—a transfer from the general plant-breeding fund. We are disassembling that fund this year, so that the actual increase in the tobacco item asked for is only \$1,500, which is to take care of tobacco investigations in South Carolina.

The CHAIRMAN. We will pass that, then. The next paragraph seems to be entirely new: "For the investigation and improvement of forage crops and methods of forage-crop production, \$20,000."

Mr. POWELL. The forage-crop purchase, testing, and distribution up to the present time, Mr. Chairman, has been handled as a regular part of the congressional distribution.

The CHAIRMAN. What phrase is there under which that has been done?

Mr. POWELL. Under the authority in the act to purchase, propagate, test, and distribute valuable seeds and plants, and the clause which provides that nothing in the act shall be construed to prevent the Secretary of Agriculture from sending seeds to those who apply for same. The same authority has been included in the seed appropriation act for many years; and it has been the practice for a good many years to purchase alfalfa, clover, grass, and other forage-crop seeds for propagation, testing, and distribution, the quantities purchased varying from year to year, depending on the cost of other seeds and the amount available after providing for the regular quotas of vegetable and flower seeds.

About five years ago the department was able to utilize as much as \$19,620 in this way, the seed being used for distribution upon requests received through Members of Congress and requests made directly to the department, and also for testing in particular localities with a view to testing their suitability for those localities, extending their culture, and thus benefiting the farmers. Owing to the special nature of the class of seeds used and the growing importance of the results secured from testing them in different localities, especially in the South and West, the work of securing, propagating, testing, and distributing forage-crop seeds was placed in charge of Prof. C. V. Piper. The amount of the seed appropriation utilized for forage-crop seed testing and distribution gradually increased from year to year to keep pace with the increased demand for the seed and the natural growth of the work in connection therewith until the fiscal year 1909,

when \$31,000 was expended for this purpose, as set forth by the chief of the bureau at that time. As it appeared likely that the increase in the demand for this class of seeds and in the work of testing them would continue, it seemed wise to make special provision for it in the appropriation bill for 1910. This was done in the form of an amendment when the bill was before the Senate committee, \$31,000 being set aside for the forage-crop work. The amendment was agreed to in conference, but for some reason which does not appear of record the amount was reduced to \$10,000. The clause in question authorized the Secretary of Agriculture to use the \$10,000 in the propagation, testing, distribution, and extension of forage crops throughout the United States.

Under this special authority the forage-crop testing and distribution was carried on last year, to which \$2,400 was added from the general seed fund for the investigation of methods of cleaning congressional seeds. This clause was omitted from the appropriation bill for the present year, 1911, by the committee, as I understand it, because they felt that the purchase, propagation, testing, and distribution of forage-crop seeds was already authorized, and because, as outlined by Dr. Galloway before the committee, the forage-crop seeds could be secured and tested without any addition to the regular appropriation for seeds. During the present fiscal year, 1911, approximately \$20,000 has been set aside for the forage-crop seed work, which is about the same as five years ago. However, as the price of all seeds is steadily advancing, both in this country and abroad (the increase in the case of some of the common seeds which are used in large quantities in the congressional distribution ranging from 20 per cent to over 100 per cent), it is evident to the department that the present quotas can not be maintained unless separate provision is made for the forage-crop work or the regular seed appropriation is increased for the coming year. It is therefore proposed to take out the \$20,000 required for the testing work in connection with forage-crop seeds and put the item on the same basis as grain investigations, farm-management investigations, or the farmers' cooperative demonstration work. This also provides for a broader basis for this work, which is very much needed in the interest of agriculture.

The CHAIRMAN. Let us pass just for a moment to page 34, where the paragraph appears, "For the purchase, propagation, testing, and distribution of valuable seeds." I will ask you to point out there the word which has covered this work heretofore. Is it in the second sentence, "And the Secretary of Agriculture is hereby directed to expend the said sum, as nearly as practicable, in the purchase, testing, and distribution," etc.?

Mr. POWELL. Yes.

The CHAIRMAN. In the word "testing."

Mr. POWELL. Yes; in the word "testing" and in the first sentence, which reads, "For the purchase, propagation, testing, and distribution of valuable seeds and plants," etc.

The CHAIRMAN. Under the authority of that word "testing" have you spent something like \$20,000?

Mr. POWELL. About \$31,000 in the fiscal year 1909 and about \$20,000 this year.

The CHAIRMAN. In the investigation of forage crops?

Mr. POWELL. In the purchase, propagation, testing, and distribution of forage-crop seed.

The CHAIRMAN. And the method of growing?

Mr. POWELL. Incidentally in the methods of growing, as they could be followed in connection with these tests, yes; but primarily for the free distribution of forage-crop seeds with the view of extending forage-crop production in different localities. The work has followed the plan outlined by Dr. Galloway before this committee in former years—that is, by distributing seed of alfalfa, clover, timothy, and other grasses, cowpeas and other leguminous crops, and the non-saccharine sorghums to individual farmers selected by Congressmen in their districts, or to others selected by the department who are co-operating with us in different localities. In some cases the testing of the varieties of seed has been done in cooperation with the different State experiment stations.

Before the inauguration of this work it had been the practice to distribute new varieties of seed obtainable commercially at home and abroad without previously testing it to determine its value in different localities. In this way there was distributed on congressional and other requests considerable quantities of seed of varieties that did not prove entirely satisfactory. Under the present arrangement extensive tests are made of different varieties, and none is distributed until its value is thoroughly determined. In this way during the last four years there has been distributed upon congressional requests large quantities of very superior varieties of sorghum, milo, kaffir corn, and alfalfa seed in the West, and cow peas, soy beans, clover, and timothy in the East. This is a return, in part, to the original idea with which the congressional distribution of seed started; namely, the purchase and distribution of seed of superior varieties of proven value. There can be no question but that the distribution in rather large quantities of forage-crop seed of new varieties and proven value has already done a great deal to advance American agriculture, while it is an open question whether the distribution of varieties concerning which little is known may not actually do more harm than good.

While we have always thought the present wording of the act gave sufficient authority for the free distribution and testing of forage-crop seeds in this way, it was considered advisable by the Secretary to introduce a separate forage-crop item in the bill, so that forage crops, like grain crops, fruit crops, and other crops specifically mentioned in the bill, could receive much more general attention than they do at the present time.

Owing to the steady advance in the price of all seeds it is estimated that the normal increase during the present year in the cost of the vegetable and flower seed alone will amount to something over \$16,000. For instance, in the single item of peas, of which over 3,000 bushels are required for congressional distribution, I am informed that owing to a world-wide shortage in the pea crop the price has advanced over 100 per cent, and that this item alone will cost nearly \$10,000 more next year than in former years.

The CHAIRMAN. I do not want to call anybody's business in question, but it seems to me that if I were interpreting that word "test-

ing," in the connection in which it appears, I would feel as if it were limited to determining the vitality and trueness to type of the seeds which were to be distributed. It seems to me to be a pretty far cry from the obvious meaning and intent of that word to an inquiry which involves a search all over the world for some particular forage plant, and field experiments looking to the development of better grades of forage, and better methods of handling it, and I am a good deal surprised to find that you have been spending something like \$20,000 in that kind of work.

Mr. POWELL. The word "testing" has been regarded by the department as meaning not only the testing for purity, for vitality, and for trueness to type, but testing also for suitability to conditions of soil and climate found in different localities in the same way that vegetable and flower seeds are tested for the congressional distribution. The appropriation act has for many years specifically provided that the seeds and plants distributed shall be "such as shall be suitable for the respective localities to which the same are to be apportioned, and in which the same are to be distributed." Such seeds as have been secured in foreign countries were in most cases obtained by the Office of Foreign Seed and Plant Introduction, which comes under a specific clause in the act. The purchase and distribution of forage crop seeds and the work involved in testing them in different localities to determine their suitability and incidentally to extend their culture has been reported to Congress year after year.

The CHAIRMAN. That is very likely true, but I do not believe the attention of the committee was ever before called to the fact that the authority for it rested upon the narrow foundation of that one word "testing" in this seed-distribution paragraph. I should like to hear from any other member of this committee as to his recollection of it.

Mr. POWELL. I have not the wording of the bill for the present fiscal year before me, but the bill for last year specifically provided that \$10,000 of the seed appropriation should be used for the propagation, testing, distribution, and extension of forage crops, so that the question I am bringing before the committee is one that has been recognized in the past by the committee in the law.

Mr. LAMB. Where is your authority there?

Mr. POWELL. Congress specifically recognized the work in the clause referred to in the bill for last year.

Mr. BEALL. What did the department understand by the omission of that phraseology in the last bill?

Mr. POWELL. The same as I have just described; that it placed the distribution and testing of forage crop seeds on the same basis as in former years before specific provision was made for it in the bill for 1910, as explained by Dr. Galloway before this committee last year.

Mr. BEALL. Then you proceeded to do exactly the same work under the phraseology in the bill last year that you had been doing under the different wording prior to that time?

Mr. POWELL. Yes, sir.

Mr. BEALL. Did you understand that there was any purpose on the part of the committee in making that change last year?

Mr. POWELL. Merely simplifying the bill, as I understood it—cutting out a provision that was not thought to be necessary.

The CHAIRMAN. I now have before me the law for 1910; and it contains this provision in the latter part of the paragraph for the purchase and distribution of valuable seeds:

Provided, also, That \$10,000 of this sum, or so much thereof as the Secretary of Agriculture may direct, shall be used in the propagation, testing, distribution, and extension of forage crops throughout the United States.

Of course that is ample authority, but it is very much more ample than the word "testing," and I did not see how you could trace it back to that one word.

Mr. BEALL. Was that word "testing" in that old law also?

The CHAIRMAN. Yes; the word "testing" was in the old law the preceding year, you see—showing that this was an afterthought and intended to be an entirely different authorization.

Mr. LAMB. How could "testing" be used over here for the investigation and improvement of forage crops and methods of forage-crop production? I do not see how they could take it from that. How could you transfer it?

Mr. POWELL. This is not a transfer; it is an entirely new item.

Mr. LAMB. I see it is a new item; but then you base your reason for the new item upon the word "testing" over here, as I understand it.

Mr. POWELL. So that the work in forage crops can be extended just as our investigations in other crops are extended.

The CHAIRMAN. In the current law there appears this language:

Provided further, That \$43,880 of which sum—

That is, the sum appropriated for the purchase and distribution of seeds—

or so much thereof as the Secretary of Agriculture shall direct, may be used to collect, purchase, test, propagate, and distribute rare and valuable seeds, bulbs, trees, shrubs, vines, cuttings, and plants from foreign countries or from our possessions, for experiment with reference to their introduction into and cultivation in this country, etc.

Do you know, Mr. Powell, whether the amount that has been spent on these forage-crop investigations has been taken from that \$43,880?

Mr. POWELL. It has been taken from the first clause, Mr. Chairman.

The CHAIRMAN. From the \$309,590?

Mr. POWELL. Yes, sir. As I recall it, that was explained to the committee two years ago by Dr. Galloway. He then showed the committee that by effecting certain economies in the purchase of seeds the department was able to use a certain amount of that money for the purchase, distribution, and testing of forage-crop seeds without in any way interfering with the regular distribution that was being made at that time. They effected certain economies in their seed contracts in the manner of packeting, assembling, and mailing the seed, and in various other ways.

Mr. LAMB. I recall something like that.

Mr. POWELL. Dr. Galloway explained to the committee that a certain amount of money might be used in the testing and handling of this forage-crop work without affecting the regular seed quotas. We have proposed this new item in order that there may be no question about the broad authority for handling the forage-crop work and also to provide a little relief on the seed fund, so that the same quotas can continue another year.

The CHAIRMAN. Then, it practically amounts to an addition of \$20,000 to the seed fund?

Mr. POWELL. It amounts to an entirely new item; yes, sir.

Mr. LAMB. That is what it is, and it would go out on a point of order.

The CHAIRMAN. I think we understand it now. Now, we will pass to the next page. It seems that "general plant breeding," etc., has been eliminated. Where did you incorporate that work?

Mr. POWELL. Plant breeding has become a method, much like cultivation or any other method. That has been incorporated to the extent of \$3,900 under the cotton and truck item, and that accounts for the rather unusual increase which I did not detect this morning when the Chairman asked me how it happened that we almost doubled that item.

The CHAIRMAN. You put this under what item?

Mr. POWELL. \$3,900 goes under the item for the control of the diseases of cotton, truck crops, and related plants. It is used in asparagus-breeding investigations. Two thousand eight hundred dollars of it is transferred to the tobacco-breeding investigations to continue work already under way in that line.

The CHAIRMAN. Next to the bottom of the page?

Mr. POWELL. Yes, sir.

The CHAIRMAN. How much?

Mr. POWELL. \$2,800 to tobacco breeding and \$7,000 is transferred to the item "For investigating the methods of growing, harvesting, packing, handling, and storing fruits," etc. Those amounts under the general plant-breeding item have been handled by specialists in truck breeding and in tobacco breeding and in fruit breeding, and it is considered advisable for administrative purposes to dissemble the item rather than to administer it under one head.

The CHAIRMAN. All right. Next, "For testing and breeding fibrous plants which may be used for paper making"—an increase of nearly \$1,000.

Mr. POWELL. That is for providing for a slight extension in the work in the laboratories here in Washington.

Mr. BEALL. What progress have you been making in the paper investigation?

Mr. POWELL. May I ask Dr. Cobb to answer in regard to the paper question? Dr. Cobb is in direct charge of the paper work.

The CHAIRMAN. Yes; we should be very glad to hear him if he has anything to offer that was not brought out in your general statement this morning. Of course, that subject was covered there.

Mr. POWELL. I gave this morning a general review of the progress we have been making along that line.

The CHAIRMAN. We shall be very glad to hear any supplementary statement that Dr. Cobb wishes to make.

Mr. COBB. There is one point that I think should be specially emphasized to the committee. That is that this project—which is a very complicated one, having a good many branches—has to be developed along one branch until we see whether it is promising or not; and we have often been turned back on one branch because we found it was closely connected with another. In that way the development is quite peculiar. At the present time one of the most important results is this: We have found in broom corn a promising material

that is immediately available for paper in competition with other similar fibers if it is mixed with such fiber as is derived from poplar.

Mr. HAWLEY. Did not some of your samples of paper contain a note that they were made with spruce sulphites?

Mr. COBB. Yes, sir.

The CHAIRMAN. Before you pass from the broom corn let us hear a little more about it. Do you take the entire stalk after the broom has been cut off?

Mr. POWELL. Yes, sir; leaves and all.

The CHAIRMAN. And use leaves, pulp, and everything?

Mr. COBB. Yes, sir.

The CHAIRMAN. You simply macerate it?

Mr. COBB. Yes, sir.

The CHAIRMAN. Green or dry?

Mr. COBB. Either. But, as a matter of fact, we use it preferably dry. It should be ripe.

Mr. HAWLEY. Do you remove the pith?

Mr. COBB. No, sir; we use pith and all. There is no separation.

The CHAIRMAN. Do you get better results from broom corn than you do from the common Indian corn?

Mr. COBB. Yes, sir. That was forecasted a year ago, as perhaps you remember, on a very reasonable basis. That plant has been developed time out of mind for toughness in the top for brooms, and that toughness extends down the stalk, and that, of course, means better fiber.

The CHAIRMAN. In any of these experiments, either with broom corn or any other material, have you tested the matter in a commercial way to see whether the paper can be made cheaply enough to compete with wood pulp?

Mr. COBB. Our experiments were all carried out with a commercial mill, with the exception of the small laboratory experiments in Washington; so we have a very fair basis for judging the cost of our operations. We are only hampered by the fact that we have not thus far felt that it was best to use the very large quantities necessary to really get the final commercial factors. We may use half a carload, or a carload. But anyone who knows about the manufacture of paper knows at once that out of that you can make perhaps less than a ton of paper, and you can not tell, with that small quantity, exactly what the cost factors are. But we get a very fair estimate; and looking at our cost in that way, we are ready to say that broom corn to-day is a crop material immediately available for the manufacture of paper.

Mr. HAWLEY. What papers do you make—writing papers, news papers, or book papers?

Mr. COBB. We can make all classes, except news papers, and except the very highest grade of bond papers. None of our crop materials thus far, as we have used them, will make the highest class of bond papers. But throwing out that small class of very high-grade paper, any class of paper except news paper can be made from our ordinary crop materials.

Mr. HAWLEY. But that is the most important item.

The CHAIRMAN. What is the matter with news paper? Is it too expensive?

Mr. COBB. News-paper pulp can be made for \$22 a ton. We can not make a pulp for \$22 a ton out of any crop material we have yet discovered.

The CHAIRMAN. You see, what we are hunting for is a substitute for wood pulp as a print-paper material.

Mr. COBB. The statistics show that the amount of wood pulp that goes into other classes of paper—magazine paper, and so on—is comparable with that which goes into news paper. So that any relief that is obtained in those higher grades of paper leaves more wood available for the lower grades of paper.

Mr. HAWLEY. Your broom corn will make good magazine paper?

Mr. COBB. Yes, sir.

The CHAIRMAN. Do you know the range of price that these broom-corn papers will probably command?

Mr. COBB. The regular market price.

The CHAIRMAN. But of course the market price depends upon the grade or quality of the paper. Book papers range all the way from 4 cents a pound to 40 cents a pound.

Mr. COBB. These materials will make all those grades of paper at those rates. That is the shortest way of expressing it. In these projects we have the advantage of close cooperation with a very progressive and large manufacturing concern.

The CHAIRMAN. What is that concern?

Mr. COBB. That is the S. D. Warren Co., of Cumberland Mills, Portland, Me., one of the largest manufacturers of book papers in the world.

The CHAIRMAN. Do you pay them for the manufacture?

Mr. COBB. We have a contract with them by which we use their small commercial plant at so much per day, and we have the privilege of using it one-half of each month of the year if we choose.

Mr. HAWLEY. You use their trained employees to do your work, do you?

Mr. COBB. Yes. We have our own experts there, and we also have the benefit of their experts. That is included in the contract, which is a very reasonable one.

The CHAIRMAN. Now will you pass to some other materials with which you have experimented?

Mr. COBB. The other materials are very numerous—corn, rice, okra, hemp, flax, and a dozen others. But we have spent our main energies on corn. We had to canvass the whole situation. Of course we could not do much with each one of such a large number; and we canvassed the whole situation, and determined that corn was the one that it would be best to spend most of our energies on, because it was very representative; and if we can succeed with it there is any amount of corn stalks to be had. Experience has shown that we were wise in that, although in the end it may prove that at present prices corn stalks can not be used for paper in competition with other materials. That remains to be determined.

The matter which I was going to mention first of all when I rose, Mr. Chairman, was the state of this project with regard to the food extract. We find, as might be expected, that nearly all our crop materials contain nutritious matter. Cornstalks and other crops are fed commercially, and sometimes fed regularly; and that means that

they have food matter in them—saccharine matter, and nitrogenous matter also. We find that in the paper mill (and this is one of our important advances) we can make a hot-water extract with the ordinary paper machinery, slightly modified, in accordance with our experiments. We find that we have to cut out all the brass valves, because otherwise we get an amount of copper in the feed extract, which renders it poisonous. By these alterations, which we have gradually worked out with the ordinary digester of the paper mill, we can make a water extract which can be evaporated to produce the molasses-like product that you all examined this morning. That is not confined to corn. It is equally true of rice, equally true of broom corn, and so on. And by the way, our estimate on broom corn throws out the value of this extract. You can make paper out of broom corn, regardless of this product, in competition with other materials to-day. This will be so much gained on broom corn, and you get just about as much of it from broom corn as you do from ordinary corn.

Mr. LAMB. What is that by-product worth?

Mr. COBB. We do not know exactly what it is worth. That is just what I was coming to. But the best indication we have is this: Using our raw materials, which have been specially grown for this purpose in carload quantities, and getting as much extract as we could from those comparatively small quantities, we have got up to several hundredweight of this material and have fed it to cattle for one month. The cattle have done well. They have not fallen off in weight, and at the end of the month they appeared to be all right. The experiment has been concluded now for something like six weeks and there are no injurious after effects. But of course that is not a completely satisfactory test, as anyone will know who knows about the nutrition of animals. There might yet occur some after effects, so that we have not fully settled the feeding value. Besides, it was not fed to a sufficient number of animals and the conditions were summer conditions. We should prefer to carry out this test in the winter, and we are preparing to do it on a large scale this winter if the funds hold out. This will be a rather expensive test and one we did not expect to be able to make this current year. However, we have made more rapid progress than we anticipated and are ready for the test this winter, if it can be financed. Otherwise it will have to go over for an entire year. It is a test that should be made in the winter season when stock are stall fed. It seems probable that the practicability of utilizing cornstalks and other similar material may hinge on the food value of this extract. The only way to establish its food value is by the feeding tests we propose to make.

Mr. LEE. How do you feed that material?

Mr. COBB. We have no trouble whatever in getting the cattle to eat it. They eat it at once in almost any way you choose to give it to them. But, as a matter of fact, we fed it with bran.

Mr. POWELL. I might say that those food tests will be made not in our bureau, but in cooperation with the Bureau of Animal Industry.

Mr. LAMB. You pour this stuff over the bran?

Mr. COBB. Yes, sir; just as if it were molasses.

Mr. LAMB. It is molasses, really.

Mr. HAWLEY. It has considerable sugar in it, has it not?

Mr. COBB. Twenty-five per cent sugar and another 25 per cent of what is chemically classed as sugar, but the nutritive value of which is somewhat uncertain. We do not know exactly what its nutritive value is.

Mr. Lamb asked what this extract is worth. We do not know until we find what the food value is. We have got this far: We know the animals take it readily and apparently have thrived on it.

Mr. HAWLEY. Have you fed it to hogs?

Mr. COBB. No, sir. We had only a sufficient quantity to make this test on two animals for a month, and we chose a yearling and an old cow.

The CHAIRMAN. Is there any change needed in the equipment of the ordinary paper mill in order to enable it to produce this food?

Mr. COBB. The only material change that will be necessary will be the providing of an evaporating plant for evaporating this extract. But that is already in operation in many different industries, and it would require very little, if any, modification in existing machinery to produce this extract. In fact, this particular extract was produced in a glue evaporator in the Warren company's mills.

Mr. LAMB. What proportion of this extract comes from, say, 100 pounds or 500 pounds?

Mr. COBB. We get about 300 pounds from a ton of cornstalks.

Mr. LAMB. Three hundred pounds of this extract from a ton of cornstalks?

Mr. COBB. Yes, sir.

The CHAIRMAN. Suppose a carload of broom-corn stalks were shipped to the mill you have told us of—would they buy them and use them?

Mr. COBB. Of course I can not speak for the company, but I have no doubt they would be glad to get a large quantity of them. As I said a little while ago, we have the benefit of their advice, and we believe them to be thoroughly impartial, and we feel a good deal reinforced by their opinion on these matters.

The CHAIRMAN. What do you think they could afford to pay for them?

Mr. COBB. They could afford to pay for the dry material at the same rate they pay relatively for poplar wood, for instance, which they get for about seven dollars and a half a cord. That cord weighs about 2,500 pounds. They could easily afford to pay \$6 a ton for it, I should think, supposing, of course, it was bone-dry.

Mr. HAWLEY. Out of what materials does this concern usually make its papers?

Mr. COBB. It uses a very great variety of material; but it uses more poplar wood than anything else.

The CHAIRMAN. They must make a high grade of paper, then.

Mr. COBB. Oh, yes; they make every grade of paper, from the finest bond and Bible paper down.

The CHAIRMAN. Do they make news paper?

Mr. COBB. No, sir.

Mr. LAMB. Does poplar wood make the very best paper you have?

Mr. COBB. In combination with other materials. Of course, they add rag pulp and a great many other materials; but they use more poplar pulp than anything else.

Mr. LAMB. Do you happen to know anything about the quantity of poplar wood that is available?

Mr. COBB. No; I am not posted on the forest statistics. I know about what they pay for wood, and I know in a general way the details of their cost in wood; but I do not know the amount of poplar available. They complain constantly of difficulty in getting it.

Mr. LAMB. I know that.

The CHAIRMAN. Are there any further questions, or have you anything further to offer on this subject?

Mr. HAWLEY. What other by-products do you get besides this?

Mr. COBB. Another very important by-product in connection with corn is this—and it is one that is of problematical value at the present time: We find that with corn there is so large a portion of the stalk that is pithy matter (not fibrous matter) that in order to make a good paper it is necessary to separate at least a portion of it. Of course, if you separated it all, you would get a pure fiber; but that would reduce your yield about half. Instead of getting 40 per cent you would only get about 20 per cent. So that this 20 per cent of pithy matter is a by-product. We have submitted small samples of this pithy pulp to a large number of manufacturers who make insulators and fancy cartons and picnic plates and handles (which are made by using a certain amount of fibrous material along with cement), and so on. There is a great range of manufacturers using articles of that class. They say that there is no doubt that this material can be used in their manufactures; but we have not yet been able to submit a sufficiently large quantity for definite results, devoting our energies as we have to other lines. As I say, this is a peculiar project, which has a number of branches. We have not assembled a sufficient quantity of this material, although we are now preparing to do so, to put it in the hands of manufacturers so as to let them try it. What the value of that by-product may be is entirely problematical.

Mr. HAWLEY. What would be the total demand for that by-product?

Mr. COBB. That we are not prepared to say, either.

Mr. HAWLEY. Is it sufficiently large to make it of any importance?

Mr. COBB. It seems to me very questionable; but as we have gone on we have been surprised at the number of uses to which wood pulp is put where they are now using a higher grade of pulp than this, though this may answer their purpose equally well. Take the matter of cotton spindles, for instance—cotton spools. An enormous quantity of them are used. They are used by scores of mills, and wear out very rapidly in the cotton mills. They do not make them now of wood so much, because wood splinters, and catches the thread at the edges of the spools. They are making them now of a composition which is made of vegetable fiber and cement.

Mr. HAWLEY. Would this pithy matter that you speak of make good plaster for walls?

Mr. COBB. I do not see any reason why it would not.

Mr. LAMB. This other by-product just saves the cow and the hog the trouble of chewing it up. That is all there is to that.

Mr. COBB. Our idea in regard to that has been this: Let us suppose that this is all established. We are not prepared to say that it will be; but Congress has directed us to make the experiment, and

we are making it. But suppose this is all established and paper is being made from cornstalks. Our idea would be that the farmer would take a portion of his cornstalks to the mill not far away, bring back this product, mix it with the balance of the cornstalks, and have a far better fodder than he would with only his cornstalks.

The CHAIRMAN. If there are no further questions, we will pass to the next paragraph: "For the breeding and physiological study of alkali-resistant and drought-resistant crops," an increase of about \$1,000. That represents all the increase there is in that item, does it?

Mr. POWELL. Yes. That is largely for field and laboratory facilities in the investigation of draught and alkali resistance.

The CHAIRMAN. "For the investigation and improvement of sugar-producing plants, including their utilization and culture," a considerable increase, nearly \$10,000. What is the occasion for that and what are you doing?

Mr. POWELL. There has been a large increase this year in the demands on the department from the sugar industry in all parts of the country for additional investigation of diseases, the cultural questions connected with the maintenance of tonnage, and for sugar-beet improvement. The \$10,000 is proposed to be used in this way: Two thousand dollars is desired for a further investigation of sugar-beet diseases. The most important investigation along that line is proposed to be made in Colorado and Kansas, where the critical factor in the culture of the beet in some of the sections appears to be the leaf blight.

The CHAIRMAN. Would that properly come under this paragraph? There is no reference here to diseases or pathological research of any kind. This relates only to improvement, utilization, and culture.

Mr. POWELL. The diseases are one of the cultural factors.

The CHAIRMAN. But "culture" is not generally interpreted to mean a study of the diseases that affect a plant, is it?

Mr. POWELL. It is inseparable from tillage, fertilizing, and other cultural problems. If a general cultural problem is under investigation it includes the various factors that enter into the production of the crop. It may be tillage, fertilizing, or the other difficulties that arise in growing.

Mr. LEE. You have had some inquiry about the diseases of ribbon cane, have you not?

Mr. POWELL. Yes. I will come to that a little later on.

Mr. LEE. Yes; I should like to have you.

Mr. POWELL. Two thousand dollars is desired to be used for a further investigation of the beet diseases, as stated, in the central western country, especially in Kansas and Colorado. Three thousand dollars is proposed to be applied to an investigation of the relation of crop rotation, of fertilizers, and other factors which enter into the production of the crop aside from those I have mentioned. The average tonnage in the sugar-beet area of this country is very much below what it might normally be made; and the department has been requested by the interests in California, Colorado, Kansas, and Michigan, and other sugar-beet producing centers to take up a more careful investigation of the agronomic factors that enter into beet production. One thousand dollars is proposed to be added to the work in the improvement of sugar beets through selection. And \$4,000 is desired

to take up an investigation of the diseases of sugar cane—the matter was asked about by Mr. Lee.

Mr. LEE. What amount?

Mr. POWELL. Four thousand dollars. That will provide a specialist, and the expenses of a specialist in the field and in Washington. That makes up the \$10,000, Mr. Chairman.

The CHAIRMAN. The sums you mention have been merely increases to the funds used for the purposes already named?

Mr. POWELL. Yes.

The CHAIRMAN. The sugar-beet industry seems to have been just about at a stand still for the last four or five years, has it not?

Mr. POWELL. Yes, sir. The tonnage has not been increasing, nor has the sugar content outside of California. There have been an increasing number of difficulties in many of the sections which have held back the development of the industry. In California, New Mexico, and Idaho the curly top has sometimes been severe. In Colorado, Kansas, and the central part of the country the leaf-blight and the lack of crop rotation have figured. The sugar-beet growers have been making brickyards out of their fields by continuing to grow the same crop year after year on the same ground, exhausting the humus rather than by applying rational crop-rotation methods, through which the fertility of the soil and its physical condition may be maintained. It is the purpose of the bureau to extend its investigations to some of these critical factors which are believed to have held the industry about steady for the last three or four years.

The CHAIRMAN. Do you know whether any sugar-beet factories have gone out of commission in the last year?

Mr. POWELL. The Lyons (New York) factory has been abandoned, and three factories in the Central West were temporarily suspended, as they could not secure the beets.

The CHAIRMAN. I believe the production is estimated this year at about 560,000 tons?

Mr. POWELL. Yes.

The CHAIRMAN. Which, as I recollect, is just about the same figure as it has been for the last four or five years?

Mr. POWELL. Just about what it was before. In Phoenix, Ariz., a large beet-sugar factory and the Nampa (Idaho) factory resumed operations again this year.

Mr. HOWELL. They are building a new sugar factory in Richfield, Utah, this season.

The CHAIRMAN. As a matter of fact, the area in which sugar-beets can probably be grown is very limited in this country, is it not?

Mr. POWELL. No; the area is many times the area utilized at present.

The CHAIRMAN. Just a narrow belt stretching across the country from the Lake region to California?

Mr. POWELL. Yes; but this belt is large enough to grow all the sugar consumed in this country. The beet can be grown in the two northern tiers of States running across the continent, including southern California and parts of more southern areas.

Mr. LAMB. What is the average percentage of saccharine matter you get?

Mr. POWELL. I will ask Dr. Cobb to answer that question.

Dr. COBB. About 14 per cent—much less than it ought to be in this country.

Mr. LAMB. They got 16 and 17 per cent at the State farm in Virginia, right across the river.

Mr. POWELL. Yes. In California the average will be near 20 per cent this year; in Michigan around 17 per cent. The percentage is variable with the locality and season.

Mr. LEVER. Dr. Galloway told us several years ago that you were making certain experiments to get a one-seeded beet, as it were.

Mr. POWELL. A single germ. Those experiments are progressing slowly. We now have beets that will produce 50 or 60 per cent with single germs; but it has not gone beyond that up to the present time. We have not yet produced a single-germ variety.

Mr. COCKS. Is that all for that paragraph?

Mr. POWELL. That is all for that paragraph.

Mr. COCKS. Pass on to the next, please.

Mr. HOWELL. Mr. Powell, I want to ask you about the white fly. A year or two ago the beet growers of my State were very much injured by what they term the white fly, which injured the sugar-beet crop. Have you had any complaint of it from any other section of the country?

Mr. POWELL. This is the beet-leaf hopper, which produces the disease referred to as curly top. This is being actively studied in this bureau, and the control of the insect is under investigation in the Bureau of Entomology.

Mr. LAMB. You ask for \$4,000 more here for the taxonomic investigations, and the study of methods for the improvement of grazing lands?

Mr. POWELL. That is to extend the study of the barrenness, due to overgrazing, in many of the western grazing lands. It has been discovered within the last year that the difficulties in reseeding are often due to the acidity of the soil. When this item was created by the committee the grazing investigation was grouped in this way, because the specialist who was carrying on the taxonomic investigation was also studying these grazing problems in cooperation with the Forest Service.

Mr. COCKS. Just how is this money spent? In finding out that there is acidity there?

Mr. POWELL. Do you refer to the grazing item?

Mr. COCKS. Yes; the grazing item. I mean just what kind of work do you do?

Mr. POWELL. The increase will be used for a study of crops especially adapted to acid soils. Our investigator who has been studying this matter has been in north Germany this year, on the heather lands, studying the crop-rotation systems—the agricultural systems that have been developed on soils that are very similar to the soils under which that condition occurs in this country.

Mr. HAWLEY. What are some of the things that grow on alkali soil?

Mr. POWELL. These are acid soils, not alkali soils. Potatoes and rye and oats grow on acid soils. Serradella is the great leguminous crop that is grown in Germany on the acid soils. Serradella will be one of the crops tested under those conditions next year.

Mr. LAMB. The chief thing there seems to be improvement in grazing lands. That takes a broad range, you know. Do you say what is best to be put on the lands, or find out what is cheaper than grass?

Mr. POWELL. That is one item in the grazing-land work. The department is also studying the methods of reseeding grazing lands and methods of handling the grass and handling the animals on the ranges so that reseeding can take place without the loss of the forage. What I referred to here was simply the lines that will be extended next year. But in the case of the grazing lands, the bureau is carrying on a large number of studies under this item.

Mr. LAMB. That is what I supposed.

The CHAIRMAN. Are there any further questions on this paragraph? If not, we will take up the next one: "To investigate and encourage the adoption of improved methods of farm management and farm practice," where you ask for an increase of some \$8,000.

Mr. POWELL. That is a very large piece of work in the bureau. The actual increase of \$10,000 is to provide for the expansion of some of the projects which Dr. Spillman is carrying on.

The CHAIRMAN. I notice in the statement that you have made here, showing the amounts turned back to the Treasury, that in 1910 it was estimated that about \$14,000 would be turned back from this fund.

Mr. POWELL. That was due very largely to the fact that there was a raid made on Dr. Spillman's men last year by business interests. When that happens toward the last of the year the bureau does not attempt to spend its money. It is turned back into the Treasury.

The CHAIRMAN. We have no criticism to offer because the money went back. We are merely inquiring with a good-natured desire to give you an opportunity to explain.

Mr. COCKS. Does that item include such work as they are doing up in New York State?

Mr. POWELL. Yes, sir.

The CHAIRMAN. Are there any further questions? If not, the next paragraph is: "For the study and demonstration of the best methods of meeting the ravages of the cotton-boll weevil," with which we are more or less familiar, and an increase of \$28,000 is asked for.

Mr. POWELL. It is an actual increase of \$35,000.

The CHAIRMAN. An actual increase of \$35,000?

Mr. POWELL. Yes. There have been several transfers under this item from the lump to the statutory roll. The purpose of that increase, Mr. Chairman, is to provide for the extension of the work in Tennessee, Florida, Alabama, and into the drier sections of west Texas. This will take about \$15,000. About \$20,000 is to be used in the employment of Dr. Knapp's agents nine months in the year rather than seven and a half months in the year. It has been found that the employment of these men for seven and a half months is too short a time to develop the best results. It is therefore proposed to extend the active work in the different States in which the Federal funds are used to nine months of the year rather than seven and a half. That will require about \$20,000—not to make increases in salaries, but to extend the work a month and a half in those sections.

The CHAIRMAN. Do you know how much was contributed to this work from the general educational fund this year?

Mr. POWELL. It was \$113,000.

The CHAIRMAN. And you expect to have something like that amount next year?

Mr. POWELL. Yes. I suppose there will be upward of \$175,000 from private funds of all sources this year.

The CHAIRMAN. What results have you had from this summer's work in the Mississippi Delta?

Mr. POWELL. From the best evidence that we can obtain through the people who have visited the department and through the trips of our men in the country there seems to be every reason to feel that the higher cultural methods, the adoption of the earlier maturing varieties, and the fall preparation of the land itself are making it possible to produce cotton in the Delta regions when those directions are followed. Dr. Knapp tells me that the work in that country has been very encouraging in the last year, judging from this year's crop.

The CHAIRMAN. We had reported to us last year the case of one man in Mississippi who was unable to raise a single bale of cotton on 700 acres, notwithstanding that he had all the advice and counsel that the department could give him. Do you know whether that man made another attempt this year and succeeded any better?

Mr. POWELL. I do not know whether he did or not. I am not personally posted on this individual case.

The CHAIRMAN. Do you know whether any methods have been devised to handle the situation in Mississippi that are different from those that were practiced in Texas? The argument last year was that on account of the difference in climate, the greater humidity and greater protection (greater opportunities for hibernating) in the delta country, the problem presents a very different phase there from what it does in the prairie country of Texas, where the climate is dry and the surroundings are materially different. Dr. Knapp and other members of the bureau who came before us last year admitted that up to that time they had not been able to figure out any way to meet the problem in Mississippi as successfully as it had been met in Texas, and I wondered whether the past summer had developed anything more encouraging?

Mr. POWELL. I should like to have this question answered by Dr. Knapp.

Mr. LEE. I think that is due, Mr. Chairman, to the overflow of the Mississippi River. You can not plant a crop there as early as you can in Texas for that reason.

The CHAIRMAN. That is one reason; yes.

Mr. POWELL. Of course in that more humid country the boll weevil is not killed as easily by exposing the bolls to sunlight as it is in west Texas, and that requires a much more close picking of the fallen squares than it does in the western country—the hot country.

The CHAIRMAN. That is one reason. Another reason is that the plantations are surrounded by forests.

Mr. HAWLEY. Have you found any cotton plant the boll of which is proof against the weevil?

Mr. POWELL. No, sir.

The CHAIRMAN. Who is there that could tell us just exactly what work has been in the Delta country this summer?

Mr. POWELL. Dr. Knapp will give you detailed information.

The CHAIRMAN. I wish you would ask him to come up to-morrow.

Mr. POWELL. I will do so.

The CHAIRMAN. We will defer further consideration of this paragraph until he comes. The next is: "For the investigation and improvement of methods of crop production under semiarid or dry-

land conditions," and the increase there asked for is something like \$15,000.

Mr. POWELL. \$15,000. We have 14 of the dry-land stations established, a list of which I read this morning, running from Texas to Canada. The use of those stations by different offices in the bureau as centers of investigation is increasing rapidly. This involves a higher cost of maintenance. The \$15,000 is an increase to provide for the increased cost of maintenance of the 14 stations, making, I think, about \$700 increase per station. The rest of the increase is to be used in handling the increase in the work in Washington.

The CHAIRMAN. I presume you use those stations to try out all your new introductions of dry-land crops of various kinds?

Mr. POWELL. To a certain extent. Those stations are used primarily to investigate crop-rotation methods, the rotation methods under which oats, barley, and wheat can be most successfully grown; and for studies in the improvement of dry-land crops through selection and breeding, and for the testing of new crops adapted to dry lands, though the testing of the new dry-land plants is scattered over a much wider area than is covered by these farms. The dry-land stations are carried on largely in cooperation with the State institutions through a very effective working arrangement. I inspected these stations this last summer, and I noticed that every State institution that I visited pointed to the Federal work as among the most important agronomic lines in progress in those States. The work is carried on in very hearty cooperation with the State authorities. These stations are visited very largely by farmers. At some of those stations you can look for miles and hardly see a house, and yet when there was an opportunity for farmers to come together there might be several thousand farmers and 30, 40, 50, or 100 automobiles gathered from all over the plains area to study the rotation methods, the varieties, and various other things in progress at the station farms.

The CHAIRMAN. The station would have to "come along" some to be able to show anything to men who are able to own automobiles. It shows they have been able to do pretty well for themselves.

Is there anything further with relation to the dry-farming item? If not, we will pass to the next paragraph: "For investigations in connection with the utilization of lands reclaimed under the reclamation act," etc.

Mr. POWELL. No increase is asked for in this item.

The CHAIRMAN. And I presume you have nothing to add to what was said in your general statement this morning?

Mr. POWELL. No; I have not, except in answer to questions.

The CHAIRMAN. Do you know, as a matter of interest to the committee, to what extent these projects are being taken up by settlers? Has there been a large influx of settlers on the various projects this summer?

Mr. POWELL. There has in the case of some of them. The new ones opened this year have been almost immediately taken up. I visited a project this summer at Scotts Bluff, where three years ago it was practically barren and where now the cottages through the alfalfa fields are almost as numerous as in one of our thickly populated agricultural regions in New York.

The CHAIRMAN. And the settlers there are making a living, are they?

Mr. POWELL. They are making good progress. I was told that they will soon have a trolley through that section on account of the increase in population.

The CHAIRMAN. What State is that?

Mr. POWELL. That is in Nebraska. On the Yuma project, which I visited earlier in the summer, and which is a horticultural, trucking, alfalfa, and Egyptian cotton project, the farm units opened for entry were promptly filed on. That was just opened this last spring.

The CHAIRMAN. Do you have in your mind instances in which the settlers on these projects have made mistakes which have been corrected by reason of the advice or of the example of the work you are doing?

Mr. POWELL. I can not give specific examples; but of course the new settlers coming into any of those sections usually carry with them the ideas on farming that they had in the section from which they came; therefore the experience of many of them the first year is rather precarious. It is found where the stations have been established for some time that there is a very large increase in the number of settlers who visit the experiment farms for the purpose of studying the methods being worked out by the department. I take that as an index of the increased interest in the farms established by the bureau, and the value of them to the settlers in showing the crop-cultivation methods, the types of crops they can grow, and irrigation methods. As examples, the bureau has helped establish the Egyptian cotton industry on the Yuma project, sugar-beet growing on the Truckee-Carson, and has shown the settlers how to protect their crops from sand storms by the use of quick growing hedges.

The CHAIRMAN. Have you put those stations in charge of some scientist from the department here, or do you try to employ a practical farmer who has had experience in that kind and latitude of country?

Mr. POWELL. We try to employ a practical farmer-scientist; not a man who has simply practical information in handling land, but who has enough training in addition to common sense and judgment to be able to lead the people in that section.

The CHAIRMAN. And who has had some experience in irrigation?

Mr. POWELL. Yes. He may be a young man in the thirties; yet in a very short time he may be a leader of the practical workers in that community.

The CHAIRMAN. We will pass to the next paragraph: "For the investigation and improvement of fruits and the methods of fruit growing, harvesting," etc. There seems to be a considerable increase in the appropriation there and a change in the wording.

Mr. POWELL. Under the general plant-breeding item considerable of the work related to the improvement in fruit varieties. Seven thousand dollars of the general plant-breeding fund is included for administrative purposes in the increase which appears in this item, and the words "improvement of fruits" are inserted so there can be no question about the authority. It is a transfer of funds and authority from the general plant-breeding item. The actual increase in pomological investigations is \$12,000, to be distributed something

like this: Nine thousand dollars to be added to the present fruit-marketing, transportation, and storage investigations, so that the work which is now in progress in different parts of the country may be extended to Oregon, Washington, and the deciduous fruit industries of California, to the fruit-marketing problems of New York, and to the transportation and marketing questions involved in fruit shipments in other parts of the United States.

Mr. HAWLEY. That includes your precooling investigation?

Mr. POWELL. Precooling, cold storage, and transportation investigations. About a thousand dollars of the increase is to provide for the care of the viticultural stations established in California and other States; about \$1,500 for the fruit-district investigations in Virginia, Arkansas, and other States; and about \$500 for the pecan nut culture investigations in Florida, Georgia, Texas, and the South generally, making a total of \$12,000. During the past year or two there has been a large increase in the demands on the department to extend its fruit transportations, marketing, and handling investigations. This next year it is proposed to investigate the handling, storage, and distribution of many of the more tender deciduous fruits grown in the new fruit-growing valleys of the Northwest. For example, prune growing in Oregon is getting to be a very large industry. At present most of the prunes grown there have to be dried. It is a difficult fruit to ship in a fresh state. The prunes grown in that locality are of unusually good quality. The department will investigate the possibility of distributing prunes from that section in a fresh condition, first by handling carefully, and then by cooling them to a low temperature before they are loaded in the cars for transportation to the East. I give that as an example of the type of work that will be extended under the fruit-marketing and transportation investigation. There will also be investigations in the Hood River Valley of Oregon and in various other of the newer fruit-growing sections.

Mr. COCKS. What will become of these fruits after they reach their destination? Will they have to be dried at some time?

Mr. POWELL. No; they are used as fresh prunes. They have high quality for eating purposes.

Mr. LEVER. I notice that you drop your investigations with reference to melons here.

Mr. POWELL. The reason is that the word "melon" is included under "fruit." It is not necessary to have it specially inserted. The word "fruit" will cover melons. That is to simplify the language.

Mr. LAMB. In the seventh paragraph, "For investigations in connection with the utilization of lands reclaimed under the reclamation act," you ask for no increase, but ask that the \$73,000 stand. You passed over that. You did not tell us much about that.

Mr. POWELL. The chairman asked whether I desired to say anything more than was said in the general review this morning, and I replied that there was nothing I desired to add unless in reply to questions. This item provides for the farms established in cooperation with the Reclamation Service on the projects that they are developing; the funds appropriated this year will be enough to look after that work the coming year.

Mr. COCKS. Did you do anything with regard to the numerous complaints of bad treatment of shippers by commission men, etc.? Could that be taken up by the department in any way?

Mr. POWELL. I think it could not under that fruit-investigating item.

Mr. COCKS. Is it a practical proposition to take up? We hear great complaint on that score.

Mr. LAMB. You have got a bill about that here, have you not?

Mr. COCKS. I should like to ask about it. I do not know just what department it would come under. It certainly has to do with the handling and shipment of fruit.

Mr. POWELL. It is a business question connected with abuses in the sale of the products rather than with their production, shipment, storage, or handling.

Mr. COCKS. But there are no doubt that there are probably great injustices wrought, especially to fruit shippers, are there not?

Mr. POWELL. I have understood so.

Mr. LEE. I know so.

The CHAIRMAN. We have all kinds of trouble whenever we change a word in the bill, and I hope you have not suggested this change of language here without feeling very certain that it is absolutely needed.

Mr. POWELL. The change takes care of the work that is now under way under the general plant-breeding item, but which, for administrative purposes, is now to be handled in several offices rather than in one.

The CHAIRMAN. If some of our good friends over on the floor were to read your statement in the record, they would inquire by what authority you are now doing the work if it is necessary to put new language in the bill in order that it may be continued.

Mr. POWELL. The authority is in the general plant-breeding item at present. This is proposed to be distributed over three different items next year, and we transfer the authority also by modifying a word or two where necessary.

The CHAIRMAN. Have you called attention to the item which was eliminated, or from which this language was dropped—the general plant-breeding item?

Mr. POWELL. I think the chairman asked, as we passed the item, how we distributed that fund.

The CHAIRMAN. You mean the paragraph for general plant breeding?

Mr. POWELL. Yes.

The CHAIRMAN. That is what I was inquiring for—to find out whether it was under the authority of that paragraph, which is now eliminated, that the work was done which you now seek to have done under this?

Mr. POWELL. Yes.

The CHAIRMAN. That makes it clear.

Mr. POWELL. The change is made for administrative purposes.

The CHAIRMAN. I understand. "To cultivate and care for experimental gardens and grounds, manage and maintain conservatories, greenhouses, and plant and fruit propagating houses," the same as last year.

Mr. POWELL. \$2,000 is the actual increase. This is to purchase coal for an auxiliary heating plant for the greenhouses which have been heated from the central plant. The demands upon the central

heating plant have been increasing rapidly, on account of the greater extent of the department, and it has been necessary to provide additional heat for the house.

The CHAIRMAN. You have put up a lot of new greenhouses during the past few months, have you not?

Mr. POWELL. None in this fiscal year. Two have been completed within the past 12 months.

The CHAIRMAN. Then, as I understand it, this paragraph relates altogether to maintenance?

Mr. POWELL. To maintenance of the grounds and the houses.

The CHAIRMAN. The grounds around the department's buildings?

Mr. POWELL. Yes; and the two-thousand-dollar increase is to provide for the heating of the auxiliary plant.

The CHAIRMAN. "For continuing the necessary improvements to establish and maintain a general experiment farm and agricultural station on the Arlington estate," an increase is asked of about \$4,000.

Mr. POWELL. There is an actual increase in that item of \$10,000, Mr. Chairman. Two types of work are included under that item for administrative purposes—the Arlington farm and horticultural investigations. The \$10,000 is proposed to be used in this way: Three thousand dollars for draining and for making available more land on the Arlington farm, which is coming into much more general use in the department as a whole as a place for experimental work, and also for providing for an increase in fixed charges on account of increased work on the farm. Five thousand dollars is to be devoted to the potato investigation which was outlined this morning. We have produced this last year some 30,000 new seedling potatoes, which are proposed to be tested in the northern potato regions for wilt resistance, blight resistance, and for new varieties, and the balance, \$2,000, is to be expended to increase the peanut investigations through the Southern States, which were also outlined this morning.

The CHAIRMAN. Referring for a moment to your potato work: Are the plants which come from the different eyes of the same potato of the same variety?

Mr. POWELL. The same variety; yes.

The CHAIRMAN. But they are not necessarily of the variety of the original parent?

Mr. POWELL. Not of the original seed parent. There is a slight variation in the potatoes produced from different eyes of the same potato; and if this variation persist long enough, and the stock is grown over widely different areas, the variation might be recognized as a varietal difference.

The CHAIRMAN. Yes. "For the maintenance of a testing garden on the Fort Brown Military Reservation at Brownsville, Tex." Is there any change in that?

Mr. POWELL. A \$3,000 increase is included.

Mr. LAMB. It is \$2,000, is it not?

Mr. POWELL. It is an actual increase of \$3,000. There is a transfer to the statutory roll of \$1,000 in the item.

The CHAIRMAN. It is not noted there.

Mr. POWELL. All of these statutory changes are noted elsewhere in the bill. It is an actual increase of \$3,000. It is to provide for the drainage and the lowering of the alkali content in the soil on this experimental farm.

The CHAIRMAN. How long has that garden been maintained there? Do you know?

Mr. POWELL. I think three years, Mr. Chairman.

The CHAIRMAN. What are you trying out?

Mr. POWELL. We are testing the new crops that seem to be adapted to the southwestern arid country. The Brownsville garden is the testing place for the southwestern introductions; Ames, Iowa, for the introduced hardy plants; Chico, Cal., for the plants for the northern semiarid belt; and the Arlington farm for the eastern country. We are also testing the forage crops in the southwest and the adaptability of the cactus as a forage crop to the arid hot regions.

The CHAIRMAN. "For general administrative expenses connected with the above mentioned lines of investigation," etc., there appears to be a decrease of some \$4,000. Is that on account of transfers?

Mr. POWELL. That is entirely connected with transfers.

The CHAIRMAN. Is there an actual increase?

Mr. POWELL. There is no increase in this fund, except in the two places already discussed.

The CHAIRMAN. Look for a moment at page 27. I notice, under the head of "Pathological laboratory," on page 27, a number of scientists, or titles of positions which I presume are filled by scientists. I presume you have no other class of employees under that list; have you?

Mr. POWELL. No, sir; that gives all of them.

The CHAIRMAN. Following the instruction of the provision in the last act, you have transferred all the clerks and executive officers from the lump fund to the statutory roll?

Mr. POWELL. Yes; in every case.

The CHAIRMAN. Every employee of any sort, except the scientists?

Mr. POWELL. Yes, sir.

The CHAIRMAN. That leaves us nothing to consider there. Let me ask you, What is a xylotomist?

Mr. POWELL. The word "xylotomist" refers to a specialist who works on wood diseases.

The CHAIRMAN. Do you know, Dr. Powell, of any changes in salaries—promotions, or anything of that sort—in this list which is presented here on pages 27, 28, and 29? Has there been any material change this year over last year?

Mr. POWELL. None whatever in those transferred to the statutory rolls, and only the ordinary promotions in the lump-fund employees that are made by the Secretary from time to time.

The CHAIRMAN. What is the highest salary?

Mr. POWELL. The highest salary in this list is \$4,000.

Mr. COCKS. I notice one item where it says: "Two unskilled laborers, at one dollar and a half per diem each," and "two skilled laborers, at one dollar and a quarter per diem each."

Mr. POWELL. I should have to refer to the record to look up the specific cases.

Mr. COCKS. Why do you call a man getting a dollar and a quarter a day a skilled laborer, and a man that gets a dollar and a half a day an unskilled laborer?

Mr. BEALL. He does actual work. [Laughter.]

Mr. POWELL. May I ask Mr. Zappone to explain the difference between the skilled and unskilled classes?

Mr. ZAPPONE. I do not think it can be explained. "Skilled" and "unskilled" are civil-service terms, the former usually being applied to a higher grade of labor.

Mr. POWELL. Yes; they are civil-service terms.

Mr. COCKS. Does an unskilled laborer demand more and get more than a skilled laborer?

Mr. ZAPPONE. As a rule he gets more.

Mr. COCKS. He does?

Mr. ZAPPONE. He gets more.

Mr. COCKS. Well, that beats me. [Laughter.]

Mr. ZAPPONE. Perhaps I did not understand your question. What I mean is that a skilled laborer gets more than an unskilled laborer.

Mr. COCKS. But it is just the reverse here.

The CHAIRMAN. Where is it?

Mr. COCKS. Under "Cotton Standardization."

Mr. ZAPPONE. That happens to be an unusual case. As a rule the skilled laborer receives a higher rate of pay than the unskilled laborer.

Mr. POWELL. I find, Mr. Chairman, in this case the skilled laborers are women who assist in the preparation of the cotton standards. The unskilled laborers are men who do heavy manual work.

Mr. LAMB. Has your scale of wages gone up this year? Have you increased salaries?

Mr. POWELL. The ordinary increases that are made each year by the Secretary have been made this last year in the lump funds.

The CHAIRMAN. I notice that under crop physiology, for example, there are two clerks at \$1,000 each; and there are several other places that are similar.

Mr. ZAPPONE. Mr. Chairman, perhaps I can explain that. The list of employees under the lump-fund appropriations is required by statute to be published in the Book of Estimates; and in complying therewith we take the rolls as they stand on some definite date—usually September 30, the time of making up the estimates; or, as in this case, if you will notice under the caption, October 1. This list [indicating] is an exact reproduction of the rolls on that date. It takes in every one. Naturally, all those who will be transferred to the statutory rolls are also to be found in that list. But you will not find them there next year, because they will have since been transferred.

The CHAIRMAN. I see. That clears up that matter.

Mr. HAWLEY. On page 29 I see, under the head of "General Plant-Breeding," the salaries of one physiologist, one expert, and one scientific assistant. I see the item is cut out from the table. Those men are transferred to other departments of the bureau, are they?

Mr. POWELL. They are now transferred to the items to which the fund was transferred.

The CHAIRMAN. Are there any further questions in relation to any of these? If not, I think we can finish up the remainder of this bureau in a few minutes and close the hearing for the day.

We now come back to the purchase and distribution of valuable seeds. Have you made any change in this, except the extraction of \$20,000?

Mr. POWELL. And an increase of \$12,000 in that part which relates to foreign seeds. Two thousand dollars of that is proposed to be

used in the handling of the work in Washington, which has increased enormously during the past year in the number of receipts and the physical handling of the work. Three thousand dollars is proposed to be used in handling the increase in the demands on the introduction gardens at Miami, Fla., Ames, Iowa, and Chico, Cal., and our gardens here at Washington. Seven thousand dollars is proposed to be used in an exploration of the Nubian date industry, for the purpose of introducing into this country the best varieties of dates that are now grown in that country, and for use in connection with Mr. Meyer's enlarged work when he enters the western Chinese frontier next year.

The CHAIRMAN. Taking into account the \$20,000 which you have transferred but not deducted, as I understand it, from your estimates here—

Mr. POWELL. That was left to take care of the increase in the cost of seeds next year so as to maintain the present distribution.

The CHAIRMAN. Yes. The net increase in this appropriation, then, is \$27,920?

Mr. POWELL. It is. Twelve thousand dollars of that is for the foreign work, with no reference made to an increase in the rest of the item, the only increase being asked for specifically. It amounts to that.

The CHAIRMAN. You ask for \$12,000, but that is a part of the total sum?

Mr. POWELL. Yes.

The CHAIRMAN. You are simply taking out a little more? You are taking \$12,000 more out of the \$300,000 than we took out last year—is that it?

Mr. POWELL. No, sir; the \$12,000 is in addition to the present amount used in foreign exploration.

The CHAIRMAN. Then you must have made a transfer somewhere.

Mr. POWELL. But it is all in the seed item.

The CHAIRMAN. I am trying to get the total. I notice on page 35 that the total amount appropriated for this work during the current year is \$309,590. The total estimates are \$301,680, which makes an apparent decrease.

Mr. POWELL. Of course, Mr. Chairman, there are quite a number of the lump-fund changes involved in that. The actual difference in that item is only the \$12,000 requested for the foreign exploration work.

The CHAIRMAN. Is there not this additional difference, that we are appropriating in another paragraph \$20,000 to carry on forage work which was paid for out of this appropriation this year?

Mr. POWELL. Yes, sir; it makes \$20,000 additional to the bill as a whole.

The CHAIRMAN. Yes; so that in point of fact there is an increase here of \$32,000?

Mr. POWELL. Yes.

The CHAIRMAN. That is what I want to get at.

Mr. RUCKER. The amount to be appropriated is less than it was before, is it not?

The CHAIRMAN. No; it is \$20,000 more. During the current year we spent \$20,000 from the appropriation, not for garden seed, but

for this forage investigation. Now they propose to take care of the forage investigation by an independent appropriation of \$20,000, leaving the amount available for the purchase of seeds \$20,000 more than it was this year.

Mr. LAMB. That is not your idea, is it?

Mr. POWELL. Yes, sir; that is exactly it.

Mr. LAMB. These figures do not show that.

Mr. POWELL. In order to get that, Capt. Lamb, you would have to take two or three different items here and you would have to take separately the items of transfer from statutory to lump roll.

Mr. LAMB. I see that—\$19,910.

Mr. POWELL. Yes. So that while the figures show an apparent increase in the amount here, there is a transfer to the lump fund.

Mr. LAMB. There is really an increase of \$12,000.

Mr. POWELL. Simply an increase of \$12,000 in that item. That is all that there is involved in it.

The CHAIRMAN. Taking into account the appropriation provided for the forage work in a different paragraph?

Mr. POWELL. No; separate from that; simply in that item alone. The total difference in the item alone due to new work is \$12,000. The difference in the bill as a whole will be \$20,000 in another item.

The CHAIRMAN. Plus \$12,000?

Mr. POWELL. Plus \$12,000 in the bill as a whole.

The CHAIRMAN. That is to say, when you consider what it is going to cost us to carry out the provisions of this seed-distribution paragraph and to do the work with forage plants, and compare what it cost us this year, it will cost \$32,000 more next year?

Mr. POWELL. Yes, sir.

The CHAIRMAN. I believe that reaches the end of this bureau; and unless members of the committee have questions to ask or the gentlemen of the bureau have something further that they wish to present to our attention, we will not detain you any longer.

Mr. COCKS. I should like to ask whether the amount carried in the bill is ample to take care of that work in New York on as large a scale as we have been conducting it this year?

Mr. POWELL. That will not provide for a large amount of new work in any part of the country.

The CHAIRMAN. You refer to the demonstration work on what are called the abandoned farms in New York?

Mr. COCKS. Yes.

Mr. POWELL. That will provide for very little extension in New York or in any other section.

The CHAIRMAN. I am still a little bit uncertain in regard to this forage-plant work in relation to the distribution of seeds, and I should like to ask you, Dr. Powell, if you have the data there from which you can tell just exactly how much money was spent last year out of the seed fund for this forage work, and how much you have allotted this year for that?

Mr. POWELL. I should have to make up a statement on that subject, Mr. Scott, which I will submit to you, and if you like I will make up a statement of the history of the handling of the forage-crop items.

The CHAIRMAN. That might be a good piece of information. Just to refresh our memories in regard to the matter, I read from the hearings of last year. Dr. Galloway said this:

There is just one little matter that might be referred to, because the question might come up, and perhaps you would like to be informed on the subject. There was carried in the appropriation for seed for a number of years an item authorizing us to expend a certain portion of that money for forage-crop work. Under that we were carrying on quite successfully a number of projects which were yielding very satisfactory results.

The work was conducted in this fashion: We were securing, to the best of our knowledge, types of forage crops which might be sent into a community and placed in the hands of individual farmers, who were acting with us and oftentimes cooperating with the stations and fixing a definite cropping system in that particular locality. We were spending about \$80,000 in that work without any detriment whatever, without taking anything at all from the usual congressional fund for the ordinary congressional seed. Last year, in order to have that item set out more distinctly, we segregated it as a special thing. Some one, probably thinking that the congressional seed distribution was going to be invaded, cut it, and it went out, or was changed to \$10,000 instead of \$80,000. Now, we put it back to its old status, as it was before, making it read as it was before.

Now it reads: "For purchase, propagation, testing, and distribution of valuable seeds," etc. Your theory is, Doctor, that the language to which Mr. Galloway referred when he said that this item had been put back was simply that one word "testing." Is that true?

Mr. POWELL. Yes.

The CHAIRMAN. But that word has always been there.

Mr. POWELL. That has always been there.

The CHAIRMAN. Therefore it seems to me that Dr. Galloway must have had some other phrase in his mind or he would not have said that it had been put back after having been cut out.

Mr. POWELL. If the chairman will allow me, I will prepare a statement showing the sequence in which that item was handled in the seed bill from year to year.

The CHAIRMAN. I would be glad if you would do that, and the amount that has been expended from year to year.

Mr. POWELL. I think it would appear more clearly by having a logical presentation from year to year.

The CHAIRMAN. All right. Then, if there is nothing further, we are very much obliged to you gentlemen from the Bureau of Plant Industry; and the committee will stand adjourned until 10.30 o'clock to-morrow morning, when we will hear from the Forest Service.

(The committee thereupon adjourned until to-morrow, Friday, December 9, 1910, at 10 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Friday, December 9, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman), presiding.

The CHAIRMAN. Gentlemen will remember that when Prof. Moore was before the committee some reference was made to the desirability of establishing a Weather Bureau station at Fort Wayne, Ind. Rep-

representative Cline, of the Fort Wayne district, was present at that time and asked the committee to be permitted to appear at a later date, when he would have certain data that he wanted to present in connection with that matter. He is here this morning, and I will ask him now to make the statement that he desired to present to the committee.

STATEMENT OF HON. CYRUS CLINE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF INDIANA.

Mr. CLINE. Mr. Chairman, I just beg of the committee to give me five minutes so that I will not interfere with your general business, while the other members are coming in. I want to show the location of Fort Wayne with reference to the stations already established. The stations established now in the Weather Bureau service are at Toledo, Ohio, Chicago, Ill., Indianapolis, Ind., and Lansing, Mich., leaving Fort Wayne in the center of this section [indicating on map], about an equal distance from these four stations that I have above described, and Fort Wayne is from 125 to 140 miles from anyone of these stations.

I want to say to the committee that the territory that would be described by a circle describing half the distance between those points here would comprise about 22 counties in northeastern Indiana, 10 counties in the edge of Ohio here, and 4 counties in Michigan, and by going to the proper bureau I found that within that territory describing just half the distance between those two points are 1,040,000 people living. Within that territory also are two very large cities, comparatively—that is Fort Wayne, with 70,000 people, and South Bend, with 50,000 people. Besides that there are at least a dozen cities with 10,000 people each within a radius of 75 miles from Fort Wayne. I want to say also that this, considering the extent of the territory involved here, is the most highly developed and widely diversified agricultural section in the United States that is not supplied with Weather Bureau service.

I want to say also, Mr. Chairman, that this is the greatest manufacturing and industrial center in the United States, considering the territory involved, because located within those 75 miles are manufacturing interests that are the greatest in the world in several of their respective lines. Within this territory here nearly every county is maintaining a public library for the convenience of the general public. There are at least eight colleges, some of them of national reputation, especially Notre Dame, at South Bend; Hillsdale College, Michigan; and the Wabash College at Warsaw. Nearly 90 per cent of all the transcontinental lines of railroad of this country pass through the territory that would be supplied by this new station. There are the Baltimore & Ohio, the Pennsylvania system, the New York Central system, involving the Lake Shore, and the Nickel Plate, the Vandalia system, and the several branches of those lines.

Another merit that Fort Wayne has for the establishment of this station is this: It is the distributing center for this entire territory, its wholesale and jobbing interests. It is a railroad center whose lines permeate all sections of this country, with early trains carrying the papers and the mail, so that they reach the rural-route service that covers every section of the territory in the early morning, and

the mail from the eastern and the western, and especially from the Fort Wayne section, reaches this section by early morning delivery route.

Mr. CHAPMAN. What time do you get the Chicago papers at Fort Wayne?

Mr. CLINE. At 10 o'clock; not in time for early delivery except those that go South by way of Fort Wayne. Those that come over the line from the northern section do not get there before 10 o'clock. The southern papers have all left, you know, on the rural route service; so that in 95 per cent of this territory the rural routes get the morning papers into the homes of the farmers before 10 o'clock in the forenoon. Those are the advantages that we ask to be considered, Mr. Chairman, with reference to the establishment of this service. Another thing I think I can safely say is this, that if this committee feels like giving us the advantages that we desire, I think the city of Fort Wayne will donate the territory, unless it is confined to the absolute business section so that it would make the cost so much that the commercial interests there would not feel that they could purchase the territory necessary. But if they were permitted, and still within a reasonable distance of the business interests, to provide a location for establishing the building, I think I can say that they would do that, if the committee would make this appropriation.

The CHAIRMAN. The Government owns the post office and the Federal court building at Fort Wayne?

Mr. CLINE. The Government owns the Federal offices at Fort Wayne, but the building is a small one, built some 30 years ago when the city did not have half the population that it has now, and the surrounding buildings are much taller than the Government building, so that it could not be used for the establishment of this service.

The CHAIRMAN. Did you state the population of Fort Wayne?

Mr. CLINE. It is nearly 70,000.

Mr. LAMB. Would it not be well for you to communicate with the authorities at Fort Wayne so as to know positively whether they will donate this site? We have had some experiences on that line.

Mr. CLINE. I would be glad to do that. I talked with one of the officers of the Commercial Club who happened to be here attending the River and Harbor Congress, and he thought he could vouch for that, and he is one of the largest property owners in the city; but I will be glad to do that.

Mr. LAMB. You had better do that, because that is a pertinent point in the whole thing.

Mr. CLINE. I wish to thank the committee for the kindness they have had in hearing me.

The CHAIRMAN. We are very glad to have heard you.

STATEMENT SUBMITTED BY MR. CLINE.

Mr. Chairman, before I proceed with the merits of Fort Wayne and the country that will be reached by the establishment of a Weather Bureau observatory, I want to thank the chairman and committee for the courtesy shown me in permitting me to be present during the discussion of this department by Prof. Moore. I desire to say that I appreciate this kindness very greatly and also the op-

portunity of presenting the claim of northeast Indiana, northwest Ohio, and a portion of southern Michigan for the establishment of this weather observatory.

The country has come to know Prof. Moore as the most thoroughly posted, the most able and efficient head of the public service this department of the Government has ever had. It appreciates his ability, and I hope to see him remain in the service sufficiently long to fully develop his plans for the perfection of the service.

Fort Wayne is the focal point in the quadrangle described by the stations located at Toledo, Lansing, Chicago, and Indianapolis. This point is more than 100 miles from any one of these locations, the distance averaging more than 125 miles. The service will supply 10 counties in Ohio, 6 in Michigan, and 22 in Indiana, reached by a radius covering one-half of the territory between the points indicated and Fort Wayne. Within this territory described above there are two cities of more than 50,000 population and a score or more with a population of over 10,000, and a large number of cities and towns, incorporated, having a population of 5,000 and less. This Weather Bureau station would supply information—considering the extent of the territory—to the greatest manufacturing district in the central West. It includes within its scope the richest and most diversified agricultural district in the United States. I speak of manufacturing, because in some of the cities within this territory are the largest manufacturing interests in their respective fields in the world. Its agricultural resources have been developed to a high state of productiveness equal to that of any other section. Within this territory there is a population of 1,141,294, whose intelligence and public spirit is marked by the establishment of more than half a score of colleges and higher institutions of learning, church societies are located in every section, with nearly every town of any size conducting one or more large public libraries.

Across this territory to be supplied from this proposed station runs 90 per cent of the transcontinental railroads, that carry annually over 200,000,000 tons of freight. These lines are fed by numerous electric interurban and steam roads that testify to the wealth, energy, and industry of the people that support them. Fort Wayne has a population of nearly 70,000 people, is a great railroad center, conducting an immense business, industrial and manufacturing. This entire territory included within this scope and directly tributary to it constitutes the distributing center of the towns and cities that are reached directly by the railway communications by their great wholesale and jobbing interests. Every section of this territory is covered by Rural Route Delivery Service. Railways reaching from this great center carry its very latest publications both morning and evening direct to the readers.

I believe that this territory is so situated with reference to the Inter-Lake region that the observations would be of very great value as information to the department. There is no station located with reference to the commerce of the country influenced by the water territory that would disclose the information for the bureau that this station would provide.

I am glad to submit the claims of this section of the country whose people are so intensely interested in the location of this observatory and awake to the benefits to be derived from it, and I hope the com-

mittee may conclude that the good of the service requires the establishment of this station. Beg to say that we do not want the bureau to be established temporarily; we want a permanent building erected, so that the service may not hereafter be temporarily inconvenienced in anyway whatever.

I will be glad at some future time, if the committee desires, to present this matter more fully, as your chairman has indicated to me that if the committee think necessary, he would give me the opportunity to do so.

The CHAIRMAN. At the request of the committee, Dr. Knapp, who has had charge of the demonstration work in connection with combating the boll weevil in the South, is here, and there are a few questions we would like to ask him. I think what we desire particularly to know is whether the experience of the past summer has developed any new methods in the treatment of the boll weevil in the Mississippi Delta country.

STATEMENT OF MR. SEAMAN A. KNAPP, IN CHARGE OF FARMERS' COOPERATIVE DEMONSTRATION WORK, BUREAU OF PLANT INDUSTRY.

The CHAIRMAN. You will doubtless remember, Dr. Knapp, stating before the committee last year that the problem presented there was quite different from that which exists in Texas and that the means which had been reasonably successful for combating the weevil in Texas, on account of physical and climatic conditions, did not seem to work so effectively in Mississippi, and we would be glad to know whether further experience has confirmed that judgment or reversed it or whether any other methods have been devised that have proven successful.

Mr. KNAPP. If I recall correctly, Mr. Chairman, that was the statement of the Bureau of Entomology, and not our statement.

The CHAIRMAN. My recollection is that in a general way it was a statement that was concurred in by all who had anything to do with the work down there. But, passing that by, we want to know what the facts are down there.

Mr. KNAPP. We have held that our methods would be just as successful in the Delta as in any other territory, but that it was a more difficult territory to handle because of the greater rainfall, and I think I stated to the committee, and if not I will state it now, that there have been periods in the history when the crop declined, when the crop of Louisiana declined over 50 per cent without any weevil, showing that climatic conditions largely controlled the situation in a country a little too wet for good cotton growing. Now, there was a case brought up, I think last year, where a very intelligent man cultivated 700 acres of cotton and claimed to have followed our methods and he failed. I sent a man to investigate, and I found that this was the situation. In many of those plantations you have to have a front levee to keep off the overflow of the river, and you have to have a back levee to prevent the water coming onto your plantation in very high water, and the back water stood against his levee until there was so much seepage that he never succeeded in making his crop, and if there had not been any weevil it is very doubtful if he would have had much crop.

That is a situation we have to deal with. The same principles hold good absolutely. I defy anyone to produce a single instance where, in the Delta or elsewhere, if our instructions have been followed, a crop of cotton was not produced.

The CHAIRMAN. Will you outline those experiments briefly, so that we may know what you mean when you use the word "principles" in this connection?

Mr. KNAPP. I want to except right there—except the weather conditions are such that they could not make it anyway. In 1908, on the 10th of July, we had in the Delta region of Louisiana, on the average, about half a bale of cotton made to the acre. There came a succession of rains, and it rained almost continuously, or at least it rained every day for 17 days, and the bolls rotted in the fields. It was not due to the weevil, but they would have lost their crop anyway. I remember one instance where we thought we would have 300 bales of cotton sure; they gathered in the fall only 50 bales. With this exception, making cotton in the Delta differs little from the upland; and hence we have advised, in the Delta, under boll-weevil conditions, not to plant on these very wet and doubtful lands unless they can drain them better. Now, the plan is simply this: The fall preparation, which I think you all understand, is to burn the stalks if they get the cotton out early, which very few do, but after the frost comes and all plant food is destroyed and the main weevils have left the field, simply to cut the stalks and turn them under deeply, so as to save the humus. If it is dry enough to give it a little winter cultivation, we harrow, so as to stir up the soil.

Plant a little later than you would under ordinary condition, because cotton is a tropical plant, and our experience is that where they are advised to plant very early half the time and sometimes two-thirds of the time they lose their crop and have to plant over again, and it makes it a little too late and causes discouragement, and they lose their best seed. Plant late enough so that it is sufficiently warm for the plant to grow rapidly. That means a vigorous plant. Use a kind of cotton that will mature early, but it is not necessary to mature all its crop, as we originally thought, within 2 feet of the ground. We can make a top crop as long as we continue to pick up the squares and to cultivate the cotton, and this year we have made a good many top crops.

The CHAIRMAN. What do you mean by a "top crop"—at the top of the plant?

Mr. KNAPP. Yes, at the top of the plant. It comes on later. There will be a period of rest, apparently, and then it puts on a top bloom and makes a crop on top. The planters, under boll-weevil conditions, have always depended on what they call the "bottom crop" and the "middle crop;" and they have not relied upon the top crop. Intensive or rapid shallow cultivation, some fertilization, so as to hasten the plant and strengthen it. Pick up and destroy the squares, because if we do that then if it is rainy weather we keep down the weevil; and we can soon destroy an entire generation of weevils. The weevil is local, largely; that is, we are not generally troubled with an invasion from other fields during that part of the season. It is the weevil that was in the field that does the damage, and hence the value of fall destruction as much as you can. Then if you pick up the squares and destroy them, in about four weeks you have wiped out

that generation. The total cost of this ranges from \$1.25 to \$2 at the outside.

Mr. LAMB. Per acre?

Mr. KNAPP. Per acre; that is, the extra cost of making a crop under boll-weevil conditions.

Mr. CHAPMAN. What is a square; a boll before it opens?

Mr. KNAPP. It is the incipient boll, the commencement, the formation. The boll weevil bores into it and lays the egg, and turns around and seals up the hole so that it can not be poisoned, and in a few days it drops off, and if it does not drop off we can shake it off, and to do that we attach poles to the handle of the cultivator and knock off the plant so that it will fall off. Now, there is this difference between the alluvial districts of Mississippi and Louisiana and the general conditions of Texas, and that is all we care about: it is so damp that the eggs of the weevil pretty generally hatch out in the square and make a weevil.

The CHAIRMAN. After it has fallen from the plant?

Mr. KNAPP. After it has fallen on the ground. It is generally very damp; that is, in the Delta region; and hence the picking of the square is much more important than it was in Texas where, if it was exposed to the sun for two hours, the larva was killed.

Mr. LAMB. How do you get that square up?

Mr. KNAPP. We get out the children and set them to picking up the squares.

Mr. LAMB. That must be a tedious process.

Mr. KNAPP. A child 6 or 7 years old can do that. They give them so much a hundred for picking up squares, and there is no difficulty about it. They say you can do it with small plantations, but you can do it with large plantations also. The largest planter in the State of Louisiana this year picked up all his squares. Generally there are enough negroes to do that.

Mr. LEVER. Why could you not get a machine on the order of the ordinary carpet sweeper that would pick them up?

Mr. KNAPP. I think we have had some machines, but it would be a little difficult. They adhere to the ground sometimes, and it would be hard to sweep them up. Possibly it could be done. But those they knock off can be picked up with the machine.

Mr. LAMB. One of those things that you use on the floor would pick up pretty near everything.

Mr. COCKS. That requires the floor to be level. The ground would have to be pretty near level, would it not?

Mr. LEVER. It is level.

Mr. KNAPP. It is a much smaller job than you might suppose. You can easily convince the farmer that it is right, because the second time he will get 10 bushels and the third time 6, and so on, until there are no squares falling off.

Mr. LAMB. You could not get a little negro in Virginia to do that. He is studying Latin and those things.

Mr. KNAPP. That is the reason you have gone out of raising cotton in Virginia.

Mr. LAMB. Oh, I have made it myself.

Mr. KNAPP. You only have a little in the south part.

Mr. HAWLEY. Did I understand you to say that the boll weevil does not travel very much?

Mr. KNAPP. Not during the best growing part of the season. Along in the fall, after the crop is about done, it will travel. When the food is practically gone in one field, it will get up in a kind of a swarm and go to another, but it does not travel so very much from one field to another during the best growing part of the season.

Mr. LEVER. How many miles eastward has the weevil come this year?

Mr. KNAPP. The distance traveled depends on the season considerably. Last year it traveled nearly 90 miles, but that was due to those heavy winds. It does not travel so much north; it travels directly east more. That is, it is not but about half way up north in the State of Mississippi, but it is clear across the State into Alabama on the south border.

The CHAIRMAN. How much more territory would you say was infested this year than last year?

Mr. KNAPP. I could not tell you exactly, because it is so irregular, in a circle. Say, a strip 90 miles on the south and 15 or 20 miles on the north, and perhaps 400 miles long, and that is running clear through Oklahoma. It has gone north a little. Probably total additional area covered is about thirty or forty thousand square miles, taking the whole strip.

Mr. LEVER. Are you willing to make any prediction as to the time when it would reach Georgia and South Carolina and that section of the country?

Mr. KNAPP. It depends on how hard a fight we make. The more we repress it and destroy it, the less the rapidity with which it will move, because it will not have the swarms to move. If they would follow our instructions strictly, we could almost stop the movement of the weevil. We would so exterminate it by taking up these squares and by keeping on cultivating until there would be comparatively few left in the fall.

Mr. CHAPMAN. How far north has it come?

Mr. KNAPP. It is in Oklahoma. It is as far north as Little Rock, Ark.

Mr. BEALL. Nearly as far north as they grow cotton?

Mr. KNAPP. Yes; nearly as far north as they grow cotton in Oklahoma. East of Oklahoma cotton is grown considerably farther north than the weevil has as yet extended.

Mr. BEALL. It is possible for cotton to be grown farther north than the boll weevil has come, is it not?

Mr. KNAPP. Yes; but it seems to be able to adjust itself to more northern conditions, but it is slower, for this reason: Frost comes earlier, and spring planting is later, and therefore it makes a longer period that it has got to live without food, and hence the destruction is much greater in the North than in the South. That is the way I account for it.

Mr. HAWLEY. Where does the weevil spend the winter?

Mr. KNAPP. You will find it under the bark on the fence posts and in the moss around on trees and in the grass, and around anywhere where it can get into a place a little out of the wind.

The CHAIRMAN. Does the same weevil ever spend two winters?

Mr. KNAPP. No; it does not spend two winters. The life of a weevill is only from 65 to 70 days; that is, out of hibernation; and 97 per cent, it is claimed—I never got down to counting weevils much,

but that is what is claimed—die in the winter, so that only 3 per cent come through. Of course, a smaller percentage will come through in a hard winter than will come through in a mild winter. In a mild winter a great many more will live. In 1908, when we had this rotting, the men abandoned the fields, and in abandoning them they abandoned them to the weevil, and the consequence was that in the fall of 1908 a great many went into winter quarters. It was mild all winter, and we had the largest emergence in 1909 that we ever knew in Louisiana.

The CHAIRMAN. Do you know what the experience was on this plantation to which you referred a while ago this year?

Mr. KNAPP. We have not our reports in this year. There were so many plantations that it did not occur to me to send for it, but I can get it. I think probably they made a crop, because all around them they have made good crops.

The CHAIRMAN. In a general way how does the situation compare now in Louisiana with that in Texas?

Mr. KNAPP. In Louisiana, for the time they have been fighting, they are just about where they were in east Texas after the same number of years. The greatest fright we have ever known was along the Brazos River in Texas, and when we approached the timber country of east Texas, because they had had no experience at all there, and one-half of the sandy loam lands there, surrounded by timber, were abandoned all through that section and absolute demoralization was started. They left their farms; just threw them right down and let them go. I am very well acquainted with that section, and we have a farm there ourselves and know the situation.

Mr. LAMB. They could have made other crops?

Mr. KNAPP. They could, but they made them all by advances, and you can get no advance except on cotton; that is the difficulty. So that they moved right off to where they thought they could make cotton. These were tenant farms, work by small farmers, negroes and white men. That is largely a white man's district. They did the same.

The CHAIRMAN. They have largely moved back now, have they not?

Mr. KNAPP. Yes.

The CHAIRMAN. Are they raising cotton again?

Mr. KNAPP. They are raising cotton. I have a farm right in that section, and in five years I have not heard the words "boll weevil" mentioned by my tenants. They pay no attention to it, and do not raise the question one way or another.

Mr. BEALL. I have been curious to know whether the weevils are really there as they were four or five years ago. Are they there?

Mr. KNAPP. Yes; I have an instance where a man went down in the Trinity bottom, and there they have very heavy timber and it is very wet. That is in Polk County. He made no previous preparation in the fall, and this year he made up his mind that he would follow the instructions. Now, on 150 acres right in the midst of timber with underbrush and everything, and weevils thicker than they ever knew, they say, by following our instructions he made 1,000 pounds of seed cotton per acre on 150 acres, and on 8 acres he was a little more careful—we called it the demonstration plat—

and he made 1,600 pounds of seed cotton per acre, yielding 570 pounds of lint cotton per acre.

The CHAIRMAN. This is in Texas.

Mr. KNAPP. Yes; and that is without fertilizer.

Mr. BEALL. That is about \$80 to the acre this year.

Mr. KNAPP. Then in the delta of Louisiana Mr. Maxwell, the largest planter in the State, raised 2,000 acres of cotton—this is in Madison Parish, right across from the Mississippi Delta—over 2,000 acres of cotton this year. I have a letter from him stating that his average was 350 pounds of lint cotton to the acre on the entire tract, made exclusively with Negro labor, and mostly tenant labor, too; but he has a good superintendent. He picked up the squares and followed instructions. I have known him many years, and he writes me that there is no question but what they can make cotton right along in the Delta.

Now, take another case of two men in Franklin Parish, good farmers. They did not farm so many acres, but they were probably a little more careful farmers. Mr. Calhoun, senior, made 79 bales on 80 acres. His son made 88 bales on 90 acres.

The CHAIRMAN. That is about the average crop of that country before the boll weevil came in?

Mr. KNAPP. No; Louisiana did not average quite a half a bale to the acre. The average crop of the State of Louisiana was about a half a bale.

The CHAIRMAN. Before the advent of the weevil?

Mr. KNAPP. Before the advent of the weevil; yes, sir.

Mr. HAWLEY. What proportion of the farmers in the places where you are working are following your instructions with any degree of satisfaction to you?

Mr. KNAPP. At first only a small portion. You must remember that when there is a universal fright and the labor leaves, credit is refused. They all make their crops on the advance system. If the banker refuses credit, a good share of the labor must leave. In our case in a single county, Wilkinson County, Miss., 1,500 families last year left because they could not obtain any advances. Now, it is worse with the large planter than it is with the small planter. Small planters will recuperate more rapidly than the large planters, because if the negroes once leave it is difficult to get them to go back, and it is like cases where people are sick, they have all sorts of nostrums, and they will tell you it is no use, and all this and that; and we have to wait, and before we can get any large following we are obliged to wait until we prove up in a community, and let them suffer in the meantime. They are ready to follow almost anybody that comes along. Last year one man plowed up 500 acres of cotton. Somebody came along and told him, "It is no use trying to raise cotton in the Delta," and he plowed up his cotton—just turned it under. His neighbor across the way we prevented from doing that, and he made half a bale to the acre. The man who had plowed up his cotton saw in the fall that he had lost \$20,000, and he was a good deal of a convert. But I am informed that in Mississippi this year so many proved up that there will probably be five times as much cotton raised next year as this year in the boll-weevil section. That is, confidence is beginning to be restored. In Louisiana it is largely restored. That is the

whole problem, to restore confidence and get the farmers to carry out instructions.

The CHAIRMAN. How did the acreage of cotton planted last year compare with the amount planted the year before, and that year with the year before that, and that year with the previous year, and so on back to the time before this thing began?

Mr. KNAPP. We have not been able this year to get any statistics at all. We have been trying to rouse up the Bureau of Statistics and the Census Bureau and get the figures, but from all we can get in Louisiana they produced a normal crop on the area that they planted.

The CHAIRMAN. Have you any information at all as to the comparative acreage?

Mr. KNAPP. I can not tell you. I do not think that there was more than one-third of the acreage.

The CHAIRMAN. What have they been doing with the other two-thirds of the land?

Mr. KNAPP. They have been raising corn. They have been shipping corn this year and last year.

The CHAIRMAN. I noticed that the Secretary's report called attention to the very interesting fact that there was raised in the South this year about one-third of the total corn crop of the country, showing that the people there are giving very much more attention to that crop than they ever did before, or are having better success with it, and I wondered if you had inquired as to the relative profit of the corn crop as compared with the profit of the cotton crop in the South.

Mr. KNAPP. It is not as great. There is no ordinary crop that will compare with the cotton crop at the present prices, but it does not require the amount of labor as to grow cotton. You can handle it with machinery. You see, there is the picking of the cotton.

The CHAIRMAN. That enters into the cost, and, therefore, is a question related to the profit.

Mr. KNAPP. I referred to the net profit. If you can raise a bale of cotton to the acre, you can not begin to get an equal net amount out of raising corn; but you can raise about as much cotton, and then raise a good deal of corn; and on their sandy hill uplands they are putting in peanuts, which make a very profitable crop.

Mr. HAWLEY. Upon what other plants does the boll weevil feed, other than the cotton plant?

Mr. KNAPP. They claim that it does not feed on any plant but cotton.

Mr. HAWLEY. None but cotton?

Mr. KNAPP. No, sir.

Mr. HAWLEY. And if cotton was not grown in any section for a little while the boll weevil would die out, you think?

Mr. KNAPP. They thought so, but you see, if a single plant was left in the country, it would harbor enough weevils to carry them over, so that it is practically impossible to exterminate the weevils by stopping the growing of cotton. We might have done that if we had started when the weevil first crossed the Mexican border, because there is a territory of scattered farms, and if we had simply wiped out all cotton production for about one hundred miles, we could have stopped the weevil.

Mr. HAWLEY. Does the weevil fed on the young boll?

Mr. KNAPP. No, sir.

Mr. HAWLEY. What part does he feed on?

Mr. KNAPP. When it first comes out in the spring there are no young squares or bolls and the weevil feeds on what is called the terminal bud; you can see what it has gnawed off. Then you can poison it if you want to, and we have advised people to poison the weevils as they come out. Now, the plan we adopt is, mature your cotton as soon as you can, and stop the food of the weevil, and destroy it as soon as possible in the fall. If you can stop it a long time before it is time to go into winter quarters, the weevils can only live six or seven days without food and, of course, you will kill most of them. We then plant a little later in the spring, and hosts of those that come out will die, and you will have less to deal with.

The CHAIRMAN. What do they feed on after the cotton has been picked?

Mr. KNAPP. Then they fly to later fields until frost comes, and then they go into winter quarters.

The CHAIRMAN. They do not feed on the leaves of the plant or on the juices of its stems?

Mr. KNAPP. They might feed on any tender leaves. They do not feed exclusively on the boll.

Mr. BEALL. If you have rains in the latter part of the summer the cotton continues to bloom up until frost, although it does not mature?

Mr. KNAPP. It continues to bloom up until frost, so that they get food as long as the plant remains.

Mr. LAMB. How do they live in the winter?

Mr. KNAPP. They live like a bear; they hibernate. They come through all right, but they come out pretty weak and a large percentage die. Plant your cotton as late as you can, stimulate its growth, and get it out as soon as possible; and the perfected picker will help in that, now.

The CHAIRMAN. They have a mechanical picker that has proved successful?

Mr. KNAPP. Yes. I doubted it myself, but this fall I took 35 men into the field—I would not allow them to just exhibit it at a fair, but I went out into a cotton field—and told them to pick. There were 35 men, all cotton men, and every one of them pronounced it a perfect success. It will pick just as clean as a negro, and it does not hurt a square or a boll or a leaf.

The CHAIRMAN. I saw a picture of one cotton picker in a field that was apparently driven by a traction engine.

Mr. KNAPP. Yes.

The CHAIRMAN. Do they make them for use by horsepower?

Mr. KNAPP. Yes.

The CHAIRMAN. The same machine?

Mr. KNAPP. The same machine. I do not know whether it is the same man; it appeared to be another party; but it is the same principle—the revolving cylinder and spindles—and the machine is drawn by two horses. Those are quite cheap; but the one I particularly examined was driven by a gasoline engine. It simply took one man to do the picking. Then they had a cleaning machine to follow it, so that if there was any little dirt or crumpled leaf or dead leaf in it it was cleaned out, and the cotton was left in better condition

than the hand-picked cotton. That machine with one man will pick 8 acres a day.

The CHAIRMAN. Is that the machine that this man Price invented?

Mr. KNAPP. That is the Price-Campbell machine.

Mr. CHAPMAN. What is the price of that?

Mr. KNAPP. The horsepower machine was \$450. I tried to get a price on the other, but I could not.

The CHAIRMAN. What was the cost of picking 8 acres; how would it compare with the usual hand-labor cost?

Mr. KNAPP. Seventy-five cents; but sometimes they pay a dollar a hundred for hand picking.

The CHAIRMAN. There are some of us on this committee who are not familiar with cotton picking, and I am trying to find the relative value of this machine as compared with hand labor.

Mr. KNAPP. Very well. If there was a bale to the acre, say you paid \$1 per 100 for picking, and it was pretty high-class cotton, you would pay \$14 a bale for hand picking.

The CHAIRMAN. That would be \$14 an acre?

Mr. KNAPP. That would be eight times \$14 for hand picking as against the work by one man with the machine. The average sort of pickers, in my estimate, will not pick more than an average of 250 pounds. Some of them will make 300 pounds, but I guess about 250 pounds would be the average.

Mr. LEVER. An average picker?

Mr. KNAPP. Of seed cotton.

Mr. LEVER. They never go that high. It takes a mighty good picker to pick 200 pounds.

Mr. BEALL. Oh, there are plenty of them in my country who will pick 500 or 600 pounds.

Mr. LEE. You do not have to wait until all the cotton opens?

Mr. KNAPP. No; you can run the machine over, and then when more opens go back again.

Mr. LEE. I thought this picker perhaps would tear up the stalks.

Mr. KNAPP. No, sir; you could not tell that the machine had gone over the plant. I had men examine everything. They could not find a punctured leaf even. Nothing was disturbed.

Mr. LEVER. Can this machine be used in rough or hilly land?

Mr. KNAPP. Yes, sir; anywhere a wagon could travel.

Mr. LEE. How many rows will it pick at once?

Mr. KNAPP. One row at a time.

Mr. RUCKER. I want to say that I am sorry that it has developed here that down in Texas under the control and suggestion of the department men have developed who can pick 600 pounds a day, while in South Carolina, with the same advantages, they can only pick 200 pounds.

Mr. KNAPP. I am more familiar with Texas, so I gave 250 pounds as an average.

Mr. BEALL. That is a fair average. You can pick faster if there is more cotton open than if it is scattered cotton. That would take 6 men to a bale, or 48 men—48 pickers. This machine would take the place of 48 pickers.

Mr. LAMB. You will reduce the price of cotton after a while.

Mr. KNAPP. It will reduce the price of cotton, yes; sure.

Mr. LEE. How long has this machine been on the market?

Mr. KNAPP. It is not on the market yet.

Mr. LEE. The first tests were made this year?

Mr. KNAPP. No; they have been at it for 10 years. I have been familiar with the principle for 7 years.

Mr. LEE. It is a cylinder with teeth on it?

Mr. KNAPP. It is two cylinders. You can make them just as high as you want to, so that you can pick any cotton if it is 6 or 8 feet high.

The CHAIRMAN. Will you not describe just how that picker works?

Mr. KNAPP. You go astride of the row, and cylinders revolve and that compresses the cotton; the cotton is compressed into a little space of 6 or 8 inches—all the cotton stalks. Then there are flexible spindles 6 or 7 inches long that are revolving, with a little thread on them, and the moment they touch the cotton they wind it right up.

The CHAIRMAN. Where is that deposited, then?

Mr. KNAPP. The cylinder revolves with these spindles, and when it comes around it hits some brushes that clean the spindles, and the cotton drops down into a receptacle; and then a little elevator takes and carries it into a depository behind the machine. There is a large basket on each side which takes the cotton.

The CHAIRMAN. It does not injure the plant so as to interfere with the development of the immature bolls?

Mr. KNAPP. I had these 35 men examine, and they could not find an injured plant in the field, or a boll or a square that was injured. In fact, you would not know that it had passed over the field, except for the tracks.

Mr. LEE. Who invented this machine?

Mr. KNAPP. A man by the name of Campbell.

Mr. LEE. Where is he?

Mr. KNAPP. He is in New York. They call it the Price-Campbell machine. Price furnishes the money and Campbell furnishes the rest of it.

Mr. BEALL. Is it a fact that the sample is very much impaired? How does the sample of this cotton gathered by the machine compare with the hand-picked cotton?

Mr. KNAPP. It is not impaired at all. It is just the same. In fact, it is cleaner when it passes through the cleaner.

Mr. BEALL. They have had demonstrations of that machine around Dallas. I did not see it myself, but my understanding was that a good deal of trash was gathered, and that a bale of cotton gathered in that way would sell for perhaps \$5 less than a hand-gathered bale.

Mr. KNAPP. No. There was more trash in the horse machine, because that revolves a little differently, although it was on the same principle; but when they exhibited at Dallas, they did not have these cleaners, and now they have the cleaner, and that trash is all removed and the cotton is cleaner than hand-picked cotton.

Mr. LEE. Was this exhibited after frost or before?

Mr. KNAPP. Before.

Mr. LEE. Would it not make a difference if it was after frost, in regard to the amount of leaves, and so forth?

Mr. KNAPP. There would be more leaves in it, I suppose, after frost.

Mr. HAWLEY. Does it not break or injure the staple of the cotton?

Mr. KNAPP. No; it does not injure the fiber, at all.

The CHAIRMAN. I should think there would be some fiber that was permanently wound up onto the thread of the spindle that would not brush off.

Mr. KNAPP. No; it is a smooth spindle, except just a little catch at the end, and it cleans perfectly. It has just a little bit of a screw right on the end, and the rest of the spindle is smooth.

Mr. BEALL. I will just say, Mr. Chairman, coming from a cotton region, that the average cost of picking cotton in the cotton section of Texas is from 60 to 75 cents per 100 pounds of seed cotton, and that the cost of gathering a bale would be about \$8 or \$9.

Mr. KNAPP. But under pressure they come up to a dollar.

Mr. BEALL. I have seen cases where it would go to a dollar. That is rare.

The CHAIRMAN. I noticed from the Secretary's report and some other sources that your work of the boys' corn clubs throughout the South has been quite successful this year. I want to ask if you have published the instructions that you used in carrying on those classes so that they would be available in the shape of farm bulletins or anything of that sort?

Mr. KNAPP. Yes, sir; we are getting them all together. Our plan is to test a matter two or three years and prove it before we publish. Now we are ready to publish, because this year when we come to give these records they are so phenomenal, running from a great many over 100 bushels up to 228 and a fraction bushels per acre, certified measurements and weights and everything. Now, we will give the methods, and they are very simple.

The CHAIRMAN. Take a specific case. If you are familiar with it, take your case of 228 bushels, and if you are not familiar with that, take some other case with which you are familiar, and state to the committee, just briefly, what work was done in that instance.

Mr. KNAPP. I can give you the general plan of all of them.

Mr. LAMB. You can give them two Virginia cases, can you not?

Mr. KNAPP. Virginia has got some very good records.

Mr. LEE. Has not South Carolina the record in the South?

Mr. KNAPP. Yes, sir. Sometimes one State will go ahead of another, due to climatic conditions. Otherwise they run pretty evenly. Virginia has made some remarkable records.

The CHAIRMAN. In order that there may be no further interruptions, prompted by the motive from which we have just suffered, I will change my request and suggest that you take the lowest yields and let us know the plan followed in producing that?

Mr. KNAPP. My records are such that I can not give you the lowest crop. I can give you the average method.

The CHAIRMAN. That is what we want.

Mr. KNAPP. The average method is a deeper seed bed in the fall. For these large records they have plowed down generally from 12 to 18 inches deep, with some implement that does not throw the subsoil to the surface too much; that is, use a subsoiler or something of that kind, so as not to bring the subsoil to the surface, which would be injurious. That gives moisture. The trouble with the corn plant has been in the South not lack of fertility or proper conditions, but they plowed so shallow that the plant did not get proper food more

than half the time. There would come a little drought, and 3 inches deep is not sufficient to make a corn crop.

Mr. HAWLEY. Was there a hardpan formed?

Mr. KNAPP. There might be, in some cases. They generally have a clay subsoil, and they generally go down into that and loosen it. So they fertilize this properly and use manure if they want to make a good crop plowing under green crops, and have good preparation; but the main point is a deep seed bed, good seed, and shallow cultivation, so as not to disturb your roots. The shallow cultivation destroys the weeds, and allows the roots of the corn full range. The trouble with corn is that there is not room enough for the roots to make a good crop. We have found that the deeper plowing and shallow cultivation tells the story in the South.

The CHAIRMAN. What do you mean by shallow cultivation?

Mr. KNAPP. An inch and a half to 2 inches, because the feeding points, the stomata of the roots, come up to within 2 inches of the surface, and if you go deeper than that with your cultivation you cut them off.

The CHAIRMAN. Is it safe to go deeper farther from the roots, so as to be sure you are not destroying the roots?

Mr. KNAPP. For instance, when the plant is 2 feet high the roots will be right across the row. When the plant is very small the first time through you can cultivate deep to good advantage, because a little pruning of the ends of the roots simply makes more feeding points; but after the plant gets pretty well established, if you go to cutting into it you injure the plant.

The CHAIRMAN. What sort of implement do you use for that cultivation?

Mr. KNAPP. They use what they call in the South an implement called a sweep, a narrow blade from 12 to 24 inches long. It will cut right under the soil and let the soil fall over it. Another is a weeder, just like reversing your fingers and scratching.

Mr. CHAPMAN. Like a hay rake?

Mr. KNAPP. Yes.

Mr. CHAPMAN. We use that in Illinois.

Mr. KNAPP. We use the northern implements, but we avoid those sharp-toothed cultivators that they use usually in the North, because they will go down too deep.

Mr. CHAPMAN. Why is it that the South, in buying corn from the North, always wants corn with the husk on?

Mr. KNAPP. On account of the weevil.

Mr. CHAPMAN. I have heard that. I wanted to know whether it was true.

Mr. KNAPP. It is a little lack of information. A great many men say you can not keep corn in the South. We just throw a little quicklime on it, and that keeps out the rats and the weevil. The rat does not want to go into anything where he gets lime in his eyes.

Mr. CHAPMAN. How is that?

Mr. KNAPP. We always snap the corn and throw it in a crib and throw a little quicklime on it, and that keeps out the weevils and the rats.

The CHAIRMAN. With the husk on?

Mr. KNAPP. Yes. That lime readily drops off, and you can keep your corn as readily in the South as you can anywhere else.

Mr. CHAPMAN. It would not do to throw that lime in the corn husks in the crib.

Mr. KNAPP. Oh, it all drops off. We have never had any injury from that at all.

The CHAIRMAN. Have you done any work of this kind in the North?

Mr. KNAPP. No; we have not. We have been so overwhelmed with demands for work that we just simply could not attend to half of it. We have not worked but about half the counties in any State.

Mr. LAMB. Are you going to neglect Missouri and Kansas?

Mr. RUCKER. That is a very pertinent question. I am glad that you asked it.

Mr. KNAPP. Well, Missouri; there was a man in there, but he is not to be there any more.

The CHAIRMAN. Did they drive him out, or did he find that they knew more than he did?

Mr. KNAPP. His own records determined the question. We would have been glad to have put a little work into Kentucky and Missouri of the same kind, because it is an astonishing thing that wherever we have not worked lands are so low that you can buy them very cheap. I will give you an instance. Twenty miles from Washington on the Pennsylvania Railroad, over here in Maryland, beautiful rolling land, with good soil, can be bought right close to the station as low as \$10 an acre.

Mr. RUCKER. The Government clerks all get that.

Mr. KNAPP. I will say that I bought one well-improved farm with a good house on it, right close to the railroad, just a short time ago.

Mr. CHAPMAN. Can you raise corn there?

Mr. KNAPP. I can raise anything I want to.

Mr. CHAPMAN. Can you get along without fertilization?

Mr. KNAPP. No, sir; that soil is a little weak for lack of fertilization. You put on a green crop, and turn it under, and fertilize it and give it a little care, and it will soon come back.

The CHAIRMAN. Do you expect to carry on some of this work in Maryland next year?

Mr. KNAPP. I should be glad to. There is a big demand for it, if we can get the funds.

Mr. RUCKER. You speak about the demands being so enormous; do they all come from the South?

Mr. KNAPP. No, sir; some of them come from New England.

Mr. RUCKER. Let me ask you, as a matter of information; would it not be well to give some of these instructive tests out in Kansas and Illinois and Missouri, some of the great producing States?

Mr. KNAPP. We have not understood that we were authorized, as yet. If we were authorized we would be glad to make tests in these other States. I am just as familiar with the northern agriculture as I am with the southern.

Mr. RUCKER. Do you say that you are not authorized?

Mr. KNAPP. I mean, with the appropriations. For instance, Congress provides so much, and it has been under a law which limits us practically to boll-weevil territory. Consequently, even in the South, the territory outside of the boll-weevil territory has been handled by private funds. We have secured \$113,000 from the gen-

eral education board, and \$70,000 from other sources, State and individual, this year.

The CHAIRMAN. The Doctor is right about that. The paragraph under which all the work we have been discussing has been done, reads "For the study and demonstration of the best methods of meeting the ravages of the cotton-boll weevil," and this work has been done merely incidental to that, as I understand it.

Mr. LAMB. Let me make one observation there that I think will be confirmed by Dr. Knapp. In Virginia, particularly, the local communities take an interest in this matter.

Mr. KNAPP. Yes.

Mr. LAMB. And they offer premiums themselves, and to these farmers' boys that make the largest yield.

Mr. KNAPP. More than that, a good share of the counties in Virginia are putting up half of the money, and the rest of it is contributed by the general education board.

Mr. LEVER. We are holding a corn show at Columbia, S. C., now, with \$10,000 in prizes offered.

Mr. KNAPP. South Carolina has put her shoulder right to the wheel, and contributed, both contributions by the State and by individuals. That is where a portion of our \$70,000 from other sources has come from.

Mr. RUCKER. If the department would spend as much money in Missouri as it has in South Carolina, I think I will guarantee that much, too.

The CHAIRMAN. What kind of green manure was it that you spoke of?

Mr. KNAPP. All kinds; cowpeas, velvet beans in the South, and a little farther north buckwheat, and for winter crops, oats and rye and barley and crimson clover, just whatever is best adapted. Frequently we advise that being put into the corn crop, and then when we take the corn off, let that grow through the winter.

Mr. McLAUGHLIN. And turn it under in the spring?

Mr. KNAPP. And turn it under in the spring.

Mr. McLAUGHLIN. Do you find any difficulty in this, that it tends to sour the soil?

Mr. KNAPP. Not much. If it does, we put a little quicklime on. That is easily remedied.

The CHAIRMAN. How do you know whether the soil needs the quicklime or not?

Mr. KNAPP. Use a piece of litmus paper, and if the soil needs lime it will show it.

Mr. LEVER. Do you know anything about Dallas rice as a winter pasturage in the South?

Mr. KNAPP. No, sir. I thought I knew all the rices, but I do not know that rice. Rice is not largely a winter crop.

Mr. LEVER. We are trying to grow Dallas rice, and it is a summer grass, I think, and it promises very well.

Mr. KNAPP. I have had considerable experience with rice. It is very susceptible to frost—all that I have ever known.

Mr. LEVER. How does your estimate here compare with your estimate of last year?

Mr. KNAPP. What is the amount, please?

Mr. LEVER. \$278,055.

Mr. KNAPP. My recollection is—at least, I was incidentally informed—that the Secretary has placed ours at \$35,000 more than last year.

Mr. LEVER. More than the appropriation for last year?

Mr. KNAPP. For last year.

Mr. LEVER. How about more than the estimate for last year?

Mr. KNAPP. Yes; more than the estimate for last year. I understood so. The reason was this: We have been working our men in this way—the demand for extensions was such that we have been able to use our men only seven and a half months, on the average. It is too short a time to do the work properly. Furthermore, the best men are not willing to be used just seven and a half months of the best months for any great length of time, so that we propose to increase the time to nine months. That is really what is needed.

Mr. LEVER. This increase asked for is to be used not in extending the work so much as in increasing the time of the work of the agents—of the men?

Mr. KNAPP. It is to increase the work and make it more effective where they are doing work. Now, another thing, it is partially for extensions in Florida and in Tennessee where we have just entered. I asked for a little more—and the Secretary thought I ought to have it—but under the pressure we will not say anything about it. I wanted, and thought we ought to have, \$10,000 for west Texas, because there is a section very rich—as large as the State of New York—that has been populated and depopulated three or four times since my knowledge of the South, because, when you have a period of good years, they raise good crops very easily, and years like this year and last year you do not raise anything; and we have found by our work in there that we can stop it and that we can raise crops every year. We raised them this year—good crops of corn—and we thought a demonstration ought to be put into west Texas.

The CHAIRMAN. Is that a cotton country?

Mr. KNAPP. Yes; a good cotton country, and it is a good corn country.

The CHAIRMAN. Did they fail this year on account of the drought?

Mr. KNAPP. Yes.

The CHAIRMAN. Not on account of the weevil?

Mr. KNAPP. Oh, no, sir. The altitude is high there. As you begin to go west you begin to get to higher altitudes, and the boll weevil has not yet gone there.

The CHAIRMAN. It would be the same stretch of your appropriation to carry your work into that region as it would to take it into Missouri or Kansas?

Mr. KNAPP. Only this is cotton producing, and we would show them how to raise cotton under their dry conditions—that would be all.

The CHAIRMAN. But that would hardly be covered under the conditions for combating the boll weevil. You have just said that the appropriation was for fighting the boll weevil, and you are not supposed to go where there is not the boll weevil.

Mr. KNAPP. The limit of the boll weevil is a little indefinite. I said I did not think there was the boll weevil. In perhaps half of the territory I have named they have had the weevil more or less.

The CHAIRMAN. Your plan in regard to the weevil is to go where he is and a little ahead of him?

Mr. KNAPP. Yes; a little anticipating.

Mr. McDERMOTT. Do you think there will be any boll weevil in Alabama and north Georgia?

Mr. KNAPP. It will cover all of Georgia eventually.

The CHAIRMAN. Is your organization practically the same now that it was three or four years ago?

Mr. KNAPP. Yes. We are precisely the same, excepting that we are perfecting the organization in discipline, and so forth. The great thing in handling 500 men—and we have now a little over 500 men—scattered and apparently working independently, is to know every day what they are doing; and that is what we aim to do, to have such perfect discipline and such a perfect drill that they will all teach the same thing and march to the music.

The CHAIRMAN. Let me see if I understand what your organization is. You have, cutting out, of course, any reference to yourself and your immediate personal assistants, a State agent in each State?

Mr. KNAPP. Yes.

The CHAIRMAN. And a district agent?

Mr. KNAPP. Yes.

The CHAIRMAN. Who has a number of counties?

Mr. KNAPP. Yes.

The CHAIRMAN. And a county agent?

Mr. KNAPP. Yes. A district agent we aim to have control of about half of a State. Take the State of Mississippi, for example; there are two district agents there. The county agent is a first-class farmer that we can instruct, and a man of reputation among his neighbors, who is willing to go into the work, but it is necessary to have a district agent to go and stay nearly a week with him and drill him as to the peculiar things, the improvements that we have, and methods, and we find that by drilling him, and with his experience, he becomes a first-class man after a little while. Then the State agent looks after general things. The district and State agents select the local men and send up to me their names and the reasons why they are to be appointed. They must be practical farmers, intelligent and progressive, of good repute among the people, and so on and so forth.

The CHAIRMAN. What wages do you pay your agents?

Mr. KNAPP. The local agents?

The CHAIRMAN. All of them.

Mr. KNAPP. The local agent we have universally paid \$75 a month, he to bear all of his expenses, furnishing his own team, and paying traveling expenses and everything, and we use him only about seven and one-half months of the best portion of the year.

Mr. HAWLEY. He operates a farm of his own?

Mr. KNAPP. He has a farm of his own; but he generally has a son or somebody that he can leave that to, and he would only be home, say, two or three times a week. But it so interferes with his management of his own farm that while he is carried away with enthusiasm for the first two years, when he gets to about the third year he begins to think he would do a great deal better to stay on his own farm.

The CHAIRMAN. Then, what do you pay the district agents?

Mr. KNAPP. They are started at \$100 a month and expenses. They are men of education and ability to speak, and so on. We have more difficulty in getting them, because they are taken by colleges and railroads and so on. They are first-class men.

Mr. HAWLEY. Do they have farms also?

Mr. KNAPP. No; they may own a farm, but they can not spend any time on it, because they have to travel. As a rule they do not have farms.

Mr. HAWLEY. And State agents?

Mr. KNAPP. The State agent we pay \$150 a month and his expenses.

Mr. LAMB. Then you have county agents?

Mr. KNAPP. The county agent is what we mean by the local agent.

The CHAIRMAN. You do not have one for every county?

Mr. KNAPP. We ought to have one for every county to do the best work. If you do not do enough of it, you do not get your best results. It is like brands of fire—you scatter them and you do not make any heat, but bring them together and you get up heat. You have to get force enough in the county to carry people with you to do your best work.

The CHAIRMAN. I take it that these employees are entirely outside of the civil service?

Mr. KNAPP. Oh, yes; they have to be. You have got to be able to remove them in a minute if they are not acceptable.

The CHAIRMAN. And what do you pay the county agents?

Mr. KNAPP. Seventy-five dollars a month and they furnish their own teams and pay their own expenses.

Mr. BEALL. What part of the year do they work?

Mr. KNAPP. That depends on the section of the country. Commencing March 1, his time would be as follows: March 1 to August 1, September 15 to December 1 (or in some cases to the 15th); he would be off duty from August 1 to September 15 and from December 1 to March 1. The district agents are valuable to hold meetings, but we have to lay the local agents off. It is the only way we can do and be economical.

Mr. RUCKER. You get your district agents from the local farmers, do you not?

Mr. KNAPP. Pretty largely. We have to have practical men. We can not take a new graduate of a college and use him. The first farmer that he came to would turn him down. He must be a man of considerable experience in farming.

Mr. RUCKER. I understood the chairman to say that according to the report of the Secretary about one-third of the corn crop of this year was raised in the South—approximately so.

Mr. KNAPP. I do not remember the totals, but nine States, including Virginia and Texas, nine States in which we are doing work, increased their crop this year over the crop of 1909 158,000,000 bushels. That was almost half of the total increase of the United States.

Mr. RUCKER. That is phenomenal. Now, what was the approximate increase in the growth of cotton in the cotton districts?

Mr. KNAPP. The reports are not all in, so we can not tell.

Mr. RUCKER. Can you form any approximate idea?

Mr. KNAPP. It is a somewhat better crop than last year.

Mr. RUCKER. Not near so much of an increase as in the corn crop?

Mr. KNAPP. No.

Mr. RUCKER. So that it would indicate that your work has been more effective in the production of corn than of cotton?

Mr. KNAPP. No. We are fighting a pest, and if it had not been for our work the cotton crop in some States would have been pretty near wiped out.

Mr. RUCKER. I appreciate that; but it being true that in the South, in these nine States you mentioned, including Virginia, they have raised about one-half of the total increase of the corn crop of this year over last year——

Mr. KNAPP. Yes.

Mr. RUCKER (continuing). And the cotton crop being probably just a little increased——

Mr. KNAPP. Yes.

Mr. RUCKER (continuing). It seems to me it might be advisable to extend your work with reference to instructing people in the raising of corn to some of the corn growing sections. What I am after is this: What change would be necessary in this bill to authorize you to go into Illinois, Missouri, Kansas, and the other great corn States?

Mr. KNAPP. Nothing but a change in that little wording of the bill, and money enough to do it.

Mr. RUCKER. Do I understand you to say, then, if you had a change in the wording, all the money appropriated would be still used in the South?

Mr. KNAPP. The sections where we are working are suffering, and their lands would lie idle, because they——

Mr. RUCKER. A few minutes ago I understood you to say that in some States, and I believe you included Missouri in it, there were areas of country that could be bought for \$10 an acre—farming land?

Mr. KNAPP. I said that was over here in Maryland.

Mr. RUCKER. And you mentioned other States, and instanced Maryland?

Mr. KNAPP. I do not know of any other States.

Mr. RUCKER. I do not think, outside of Virginia and Maryland, probably, you could find lands at that price. I want to ask you this: Do you not believe that it would be advisable to give some instruction in the great corn belt? I do not mean to take anything away from the South at all, but would it not be well to give some instruction in the production of corn in those States where they produce corn?

Mr. KNAPP. There is no question but what it would be helpful; that they are suffering from the same causes as in the South, an improper seed bed and improper cultivation of their crop.

Mr. RUCKER. Do you not believe it would be wise legislation to so amend this bill, if necessary, as to authorize the department to do something in that section?

Mr. KNAPP. Yes; the basal movement in favor of cheaper living is corn. You can try any other crop and it will not work.

Mr. RUCKER. There is some difference of opinion about that, I think.

Mr. KNAPP. Yes; the movement must be corn, because we can grow more food to the acre in corn than in any other cereal. It is of wider habitat. The people understand it better, and we can more

readily revolutionize things; and that is the basis of cheap meats, and so forth. So that if we want to attack the living problem, we must go at it in that way.

Mr. LAMB. I heard a Virginia farmer say that about 50 years ago.

Mr. CHAPMAN. I want to ask Dr. Knapp one question about the quality of corn raised in the South. How does it compare in quality with that raised in the corn belt?

Mr. KNAPP. It has a little more nitrogen, and hence if you are not careful it might not keep as well, and that was the first test we made. We shipped a carload of corn from Shreveport to New Orleans for export, and had it examined by exporters familiar with corn North and South. I got a certificate back from them that it was A-1; that is the best quality of corn that can be shipped.

Mr. HAWLEY. Did you hear from it after it reached its destination in the Old World?

Mr. KNAPP. No; I do not know whether it went to the Old World. They called it "export." They may have sent it to New York. I do not know where it went to. They shipped it. No; I have not heard.

Mr. CHAPMAN. These boys' clubs you organized in the South, have they not been in existence in Illinois and some of the corn-raising States many years before they began in the South?

Mr. KNAPP. I do not think it is anything new—a boys' club—but I know of no club where a boy was taught scientifically to make corn. That is the difference. They would organize a club, and it was a sort of a general arrangement. They gave the boys no definite system of corn production. Now, our boys study the corn crop, and we have boys who can tell you better than any people in the United States, almost, how to raise a good crop of corn.

Mr. CHAPMAN. We have corn-breeding instruction in Illinois.

Mr. KNAPP. Yes, that is corn breeding; but the method of producing the largest crop of corn these boys study, and they have followed the instructions better than their fathers, and that is why they have come out ahead. We have a club of 48 boys in one county in Mississippi that averaged 92 bushels per acre.

The CHAIRMAN. Each boy growing 1 acre?

Mr. KNAPP. Each growing 1 acre; yes, sir. Each boy grew 1 acre, and the average was 92 bushels.

Mr. McLAUGHLIN. Ninety-two bushels of ear corn?

Mr. KNAPP. No; shelled corn.

Mr. HAWLEY. Was that selected acre the best they could get?

Mr. KNAPP. Well, I presume so, or else he would not be a smart boy.

The CHAIRMAN. Two or three years ago when I happened to be in South Carolina there was a good deal of talk about a method for stunting the growth of corn in order to produce more ears and less stalk. Have you ever taken that into account at all in your southern corn work?

Mr. KNAPP. Yes; we have tried it, and failed so many times that we abandoned it. There are one or two sections where that is done. There is a section, where this originated, where there is such a tendency to growth of stalk that possibly a little stunting might work, but it is a very bad policy to advocate. No man ever tried to make

a large pig by stunting him for two or three weeks. It is not in the philosophy of nature to do such things.

The CHAIRMAN. But a pig is not made up of stalks and ears.

Mr. COX. Largely of ears. [Laughter.]

Mr. KNAPP. The same principle applies.

Mr. HAWLEY. Does the stunting of the stalk result in the deterioration of the ear also?

Mr. KNAPP. It makes a small ear. We have planted by the side of this method, I suppose, a thousand trials, and the experiment station of South Carolina has tried it the same way. Our method is far superior to that.

Mr. LEVER. Your method of fertilization is about the same?

Mr. KNAPP. Yes. He uses the same, because that is the old method, and ours is an old method, for that matter.

Mr. CHAPMAN. Is it possible to keep corn in the South, in Louisiana and the section you have been talking about here, without using some artificial method, liming with unslacked lime, or something like that?

Mr. KNAPP. You could in some cases, but in some seasons the weevil would destroy a good deal of it unless you put something on it. We are more subject to the weevil in the South than you are in the North. But you can do it. I have never had any trouble in keeping corn, and the farmers, generally, in Louisiana, where I have been acquainted with it, have had no trouble in keeping corn, and, in fact, most of the small farmers in the hill regions there have bought no corn for some years.

The CHAIRMAN. When you first began this demonstration work I believe you told the committee that you thought it wise to keep your demonstrators in the field in any given locality about five years?

Mr. KNAPP. Yes.

The CHAIRMAN. I believe that time is up with some of these localities. Have you it in mind to withdraw from any, or have you withdrawn from any?

Mr. KNAPP. We have done this: Where we have been in about three years we ask the community to help, if they appreciate it, and we have withdrawn from some counties, not entirely, but just a little, and extended the work. But bear in mind that we have not worked over but about half the counties in any State but South Carolina. South Carolina being a small State and they contributing, we have worked more than half the counties in South Carolina.

The CHAIRMAN. Do you have to work every county, or does not the influence of your work extend over to adjoining counties?

Mr. KNAPP. I do not know how it would be in other places, but in the Southern States, some way or another, they do not change their system unless you go right down into the immediate neighborhood.

The CHAIRMAN. Then how is it with the farmers who are not in immediate contact?

Mr. KNAPP. They change some things. For instance, we can get them to select their seed a little better, and some things we are able to move in a general way, but their whole system of getting at the crop in the fall and handling it on our plan, we have to get right into the community and use every force possible to get them to change those old habits they have had for nobody knows how long.

The CHAIRMAN. It illustrates again the old experience that every benefit to the people of a country has to be forced upon them by main strength.

Mr. KNAPP. Well, in a sense that is it; and yet I will say this, the people are far more responsive than I thought for, because we were told, and have been told, that you could not do it, it would not be possible to reach the negro and to reach some of the poorer whites that did not read; but we have done it, and we are able to make an entirely new farmer and a new man out of him, and a better citizen.

Mr. HAWLEY. What is the chief difficulty? Because it takes more labor to make the crop?

Mr. KNAPP. Oh, no; every man believes that he has the best plan in the world. He does not travel; he does not read. I will give you a sample.

To give you an example, Congressman Small started with us to interest all the farmers in corn. That was last year, 1909. In March they called meetings in his district, several of them, I think some eight or ten, and we would have as high as 300 farmers come in, and the plan was to have each one bring in 50 ears of corn that they were intending to plant, or samples of what they intended to plant. I remember one day there were about 300, and we had them spread out on long tables in the park, and every man marched up as proudly as you could imagine. He thought that he had the best corn. He had been using it for a good many years on his farm. Now, before the day closed, 95 per cent of that corn was chucked under the table, or fed to hogs. Just the publicity showed them. They had supposed they had the best, and knew all about it. That is the tendency. The less a man knows the more he thinks he knows all about it.

Mr. LEVER. What was the defect in that corn?

Mr. KNAPP. Some of it was mere nubbins.

Mr. LEVER. And all cob?

Mr. KNAPP. And all cob, and all sorts of things.

Mr. LAMB. Do the State authorities cooperate with you to your satisfaction?

Mr. KNAPP. Yes.

Mr. LAMB. Do the State departments of agriculture also cooperate? operate?

Mr. KNAPP. Yes; the State of Virginia is cooperating grandly.

Mr. LAMB. You know in the State of Virginia we keep a force of inspectors there.

Mr. KNAPP. Yes; and the governor and the State superintendent and everybody is doing their best in Virginia; and in South Carolina, and a great many of the other States; and the colleges are helping, and they all unify the work.

Mr. BEALL. How about these corn experiments in Texas? How were you satisfied with the results there this year?

Mr. KNAPP. Oh, they were splendid. Away out there where the average man did not raise a pound of corn, we raised over 50 bushels, in some cases, to the acre, away out West, showing what you can do if you really prepare your soil right and work it right. Texas had a great corn show. I went to the Dallas corn show and it was a great corn show. Texas is doing well.

The CHAIRMAN. There has been cotton raised as far north as northern Oklahoma, and in the southern tier of counties in Kansas, in a sort of desultory way?

Mr. KNAPP. Yes.

The CHAIRMAN. And in Missouri, as Judge Rucker says?

Mr. KNAPP. Yes.

The CHAIRMAN. I think one reason, I may say, why it has not been followed up is because of the labor conditions, but with the development of this successful picker that problem will be largely solved, and I would like to inquire whether you think there are varieties of cotton that would mature during an ordinary southern Kansas season?

Mr. KNAPP. I think so. They used to raise cotton in Maryland as far north as Washington. It was formerly one of their staple crops. But you must understand, Mr. Chairman, that the cotton grown so far north is of rather inferior staple; it has a shorter staple and it has to mature quicker. Those fine long staples can only be grown in the South. But you could get a cotton, even now, that you could soon adapt, one that would mature in south Kansas and make a good profitable crop.

Mr. RUCKER. Is there not some cotton—not much, but some—grown in southern Missouri?

Mr. KNAPP. Yes; there is.

Mr. RUCKER. Do you not think it would be well for the department to go up there and give us some instructions to ward off the damages and dangers we would suffer when the weevil gets there?

Mr. KNAPP. I am perfectly willing, provided the funds will permit. We had hoped to do something in southern Missouri this year, but I do not know as it will be possible.

The CHAIRMAN. Is there nothing further? We are greatly obliged to Dr. Knapp for his presence here this morning.

Mr. KNAPP. I thank you very much.

(At 12 o'clock m., the committee adjourned until to-morrow, Saturday, December 10, 1910, at 10.30 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
Saturday, December 10, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

The CHAIRMAN. The members of the committee will doubtless remember that when the bill was on the floor last year it was more severely criticized, perhaps, in relation to the estimates for the Bureau of Forestry than for any other bureau. Attention was called, for example, to the fact that, while the increase of \$397,500 to the appropriation was stated to have been made in order to take care of 26,000,000 additional acres which had been added to the forests, some 14,000,000 acres of this addition were in Alaska, segregated into two forests, for which the total appropriation was something over \$26,000, whereas if the appropriation had been made in proportion to the increased acreage an appropriation of \$220,110 would have been required, and the charge was made that under cover of taking care of additional forests in Alaska we were appropriating \$220,000 for some other purpose, which was denounced as scandalous extravagance. Attention was also called to the fact that inasmuch as Alaska contains 378,000,000 acres of forests, if they were included in the national reservation, there might be \$10,000,000 added to the appropriation on that account. It was further stated that the Forest Service expended \$85,000, in the language of the gentleman from Wyoming, "For the publication of praise of the methods of the Forest Service." It was further stated that the great timber owners of the country have been hand in glove with the Service, and it was given as a reason for that fact that the retention of vast areas of timber lands in the hands of the Government must inevitably enhance the present value of all individual holdings. It was stated again that stumpage was sold in such manner as to virtually establish a monopoly in the lumber business in some particular region, and the case cited was that of one man who paid \$6 for stumpage when private stumpage in the community was worth \$1.50.

The question was asked, in response to a suggestion from Mr. Mondell, whether any small stockmen had been rejected or their offers refused, in order to give the range to the great stock companies, and the answer was "Time out of mind." The statement was made that the Forest Service has spent more money in matters that do not directly relate to the preservation of the forests in the reserves than in matters that do relate to that subject. It was further declared that the Interior Department for \$350,000 protected the forests as well as they are protected to-day, with less fire loss, and that the acreage was then one-third what it is now, so at the same ratio the Interior Department for \$1,000,000 would have given protection to the present area, as against \$4,000,000 expended by the Forest Service, and that no man could say the fire protection was not as good

then as it is now. A specific instance was given of alleged discrimination against a small sheep man, who was compelled to go 120 miles to a summer range, when he had been occupying a range 20 miles away, and compelled to cross a State line, where he met a State quarantine, and to cross a range of mountains in order to get feed. When attention was directed to the fact that there had been a great increase in the number of permits for grazing it was alleged that this increase was due to the fact that large sheepmen are requested to divide up their permits, so that one owner would get a permit for a small number of sheep, one of his herders would get a permit for another small number, and a second herder for still another, and so on, making it appear that the leasing was made to small, independent owners of sheep, when, as a matter of fact, it was merely a subterfuge, covering the case of one great sheep owner. Discussing the question of the retention in national forests of large bodies of land which were not devoted to the growth of timber, or upon which no timber now exists, Mr. Englebright, of California, called attention to the fact that in the Manti National Forest, Utah, which comprises 786,000 acres, it appears from the official reports that there are 225 feet of lumber to the acre, which would make a cord of wood to about $4\frac{1}{2}$ acres, so that he figures the actual value of the wood on that national forest at about 52 cents an acre.

He further calls attention to the fact that upon this Manti Forest Reserve there were grazed last year 19,666 head of cattle and horses and 189,000 head of sheep and goats. The estimate carried in the bill for the care of that reservation was \$38,000. He speaks of another forest, which he does not name, in which he estimates the value of the timber at 33 cents an acre. Discussing this same subject, Mr. Taylor, of Colorado, declared that of the approximately 16,000,000 acres within the forest reserves in the State of Colorado more than two-thirds are not covered by any merchantable timber whatever; he states further than 5,000,000 acres of land in his State which is included in forest reserves, as a matter of fact, is leased as grazing lands, and yet would produce if used for agricultural purposes crops worth from \$25 to \$50 an acre. He stated that he personally owned two small ranches, one of 20 acres and the other of about 50 acres, within a mile and a half of a forest reserve, every acre of which could be sold for \$300 an acre, and yet not in any way better land than some in the forest reserve. He was asked whether the land within the forest reserves was of the same character and bore the same relation to water as the little ranches he owned, and he replied that such was the case, and stated further, "I think there are approximately 5,000,000 acres of land in Colorado that can be turned into profitable agricultural use if we can get them eliminated from the forest reserve." Referring again to what he designated as "the scandalous extravagance" of the Forest Service, Mr. Mondell questioned the need of \$44,000 worth of typewriters in one year. Other attacks, as the members of the committee will remember, were made along the same general lines. It has seemed to me to be proper to review this legislative history in order that the Chief of the Forest Service may have some idea of the line along which we would like to have him pursue this discussion.

I have asked Mr. Graves, the Forester, to appear before the committee this morning, and, before taking up the items in the bill in

detail, will ask him to make whatever statement he desires, including in his remarks before he closes the answers he may have to make to the criticisms to which I have alluded, taking them up in any order which he may prefer.

STATEMENT OF MR. HENRY S. GRAVES, FORESTER.

Mr. GRAVES. Mr. Chairman and gentlemen of the committee, I would like, in an introductory way, to call attention to a few considerations which I feel are of importance and which have come to me as the result of my experience of nearly a year in the direction of the Forest Service. The work of the Forest Service falls under two general heads—first, the administration and development of the national forests, and second, the promotion of the science and practice of forestry throughout the country, on private and State lands as well as on the national lands. The most important problem on the national forests is their protection from fire. A second consideration which I feel is of the greatest importance, is the efficient and economical administration of the business of the forests. Third, there is the development of forests to make their resources more readily available now and to build up the forests for their use in the future.

Under the general head of the promotion of the science and practice of forestry comes the investigative work of the bureau. This falls under two subdivisions, (1) the investigations which will lead to a better knowledge of our trees and of the methods of the practice of forestry, and (2) the study of forest products to reduce waste and increase their economical usefulness. Under the first of these two subdivisions falls also the work of cooperation with States and with private owners to hasten the introduction of forestry on private and State lands. I wanted to call attention to those general points before taking up any discussion in detail.

I think the most important matter for consideration is the subject of forest fires, and that would involve some considerable discussion, Mr. Chairman. Would you like to defer that until after I have answered the charges that you have mentioned as being brought up?

The CHAIRMAN. No; I think the most satisfactory way would be for you to proceed on the line you have commenced and discuss the work of the bureau and any particular problems, such as protection against fire, upon which you may desire to lay special stress, reserving until the conclusion of your remarks the answers you wish to make to the criticisms to which I have called your attention.

Mr. GRAVES. I would not undertake to discuss all of the different problems of the lines of work in detail, as that would take a very long description. I want to speak first of the question of expenditures. We have never had in the Forest Service a complete cost-keeping system. The rangers and other field officers are required to keep a diary of their time. Frequently this diary is unquestionably incomplete and inaccurate, because the ranger spends his time on a good many different lines of work. In a single day he may make a small timber sale, issue a free-use permit, put out a forest fire, or issue a grazing permit, and do other lines of business on one of his trips through the forest. It is rather difficult, therefore, to divide his time and determine just what the grazing cost, what the timber sales cost, what the work of agricultural settlement costs, and so on.

We have felt that any elaborate system of cost keeping, which would give that information accurately, would be pretty expensive; at least we have never found a system which would give the precise results without considerable expense, and it did not seem to be justified. I believe, however, that we should have some sort of a better cost-keeping scheme than we have now. I have endeavored to determine, as near as possible, the cost of the different lines of work, as there seems to have been a great deal of confusion as to just how much was spent on administration, protection, and so forth.

The figures which I have are for the year ending July 1, 1910. For general administration the cost was 12 per cent. For the current year 10 per cent is allowed by law for general administration; the extra 2 per cent includes some administrative expenses which have been reduced—the administrative force at Washington and in the district offices has been considerably reduced—and there is also included some of the general administrative expense connected with the timber sales, for I wanted to give under that item the actual cost in the field of conducting timber sales. For investigations, we spent 6.5 per cent of the appropriation. That is the scientific and experimental work. For timber sales the actual cost of the sales in the field—and that does not include administration from Washington, but does include direction from the district offices—was 5 per cent; the actual cost was approximately \$227,000, and the receipts, which I will give accurately a little later, are a little over \$1,000,000. For conducting the work of free use of timber, 2.5 per cent; that is, we give away a large amount of timber to settlers, and the business connected with that free use cost us \$128,392, as near as I can estimate. That is approximately a dollar a thousand, based on the measurement of the timber.

Mr. McLAUGHLIN. Did it cost that much to give it away?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. Have you the value of the timber that was given away?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. I did not intend to interrupt you for that purpose, but thought you could give it without referring to your other papers.

Mr. GRAVES. I think I have it right here. No, I have not the value, but the amount, 104,796,000 board feet; that is, applications for free use by settlers, which we give away up to \$20 worth.

Mr. McLAUGHLIN. I suppose that includes the time of investigations by the rangers in cases where the requests are not granted?

Mr. GRAVES. There might be requests made by persons who could well afford to buy it, or by persons living in towns, and so on, which would be refused.

Mr. McLAUGHLIN. But this expense does include the expense of investigating such cases?

Mr. GRAVES. Yes; the time of the rangers in the free-use work is included, as well as time in preparing reports. For grazing we spent \$450,000, or 9.5 per cent of the appropriation.

The CHAIRMAN. I do not know whether you stated by way of prelude that you had prepared these figures in tabulated form and would present it?

Mr. GRAVES. Yes; I have a table which can be inserted in the record.

The CHAIRMAN. I think that would be highly desirable; we should have a table that would present the matter at a glance, a table showing the percentage of the total appropriation expended under the different heads and the actual amount in dollars which that percentage covers and the business done—that is to say, the returns received from the sale of timber, the fees taken in from grazing lands, the value and the quantity of timber given away by free-use permits, and so on.

Mr. GRAVES. I have all of those statistics and I can arrange them for insertion in the record in the form of a table.

Line of work.	Cost.	Per cent.	Remarks.
General administration.....	\$561,411.24	12.0	
Investigations.....	312,595.06	6.5	
Timber sales.....	227,071.20	5.0	Amount, 379,616,000 board feet; receipts, \$1,043,428.20.
Free use of timber.....	128,393.00	2.5	Amount, 104,796,000 board feet; value, \$176,166.51.
Grazing.....	450,200.00	9.5	Receipts, \$986,909.38; stock grazed: Cattle, 1,400,873; horses, 84,552; hogs, 3,145; sheep, 7,558,650; goats, 90,300.
Settlement, boundaries, claims, and special use.....	\$24,314.27	17.5	Receipts (special use), \$59,810.50.
Planting, planting experiments, and seed collection.....	180,116.50	4.0	
Publication, etc.....	40,383.99	1.0	
Cruising.....	215,784.27	4.5	
Improvements.....	598,835.64	13.0	
Protection.....	1,139,710.90	24.5	
Total expenditures Forest Service work, fiscal year 1910.....	4,678,427.37	100	

For settlement, boundaries, claims, and special use, \$824,314.27. I will explain what that work is. Settlement is the carrying out of the act of June 11, 1906, which permits agricultural settlement; boundaries is the work of examining the boundaries of the forests, which we have been carrying on for the last two years in order to determine what lands may have been included which were not properly forest lands and what were excluded which would properly be forest lands. Claims means the examination of mining and other claims, while special use includes the granting and looking after of special uses of land within the forests for summer camps, cabins, pastures, power sites, mill sites, and many other purposes. We expended \$824,314.27, which is 17.5 per cent. Now, nearly all of that work, of course, brings in no return. For some of the special uses there is a charge, amounting to approximately \$60,000, so that for an expenditure of over \$824,000 there is a return of only about \$60,000. Of course, the work of settlement, boundaries, and claims is unproductive work so far as returns in money to the Government are concerned. For planting, planting experiments, and seed collection, \$180,116.50. This was about 4 per cent of the total expenditures, most of it being for the rangers' time. For publication and dissemination of results, \$40,383.99, which is 1 per cent. For cruising, which is the work of stock taking, determining how much timber we have, its character, where the bodies of matured timber lie, and so on, \$215,784.27, which is 4.5 per cent. For improvements there was an appropriation, a special item, of \$600,000, from which we have spent \$598,835.64, or

13 per cent. For protection, \$1,139,710.90, which was 24.5 per cent; approximately a quarter of the total appropriation went for protection. This completes the item of expenditures. I would like now to discuss the subject of forest fires and give some description of the fires that we had this summer, if agreeable to the committee.

The CHAIRMAN. We would be very glad to hear that discussed.

Mr. GRAVES. In the first place, I would like to say that there have been fires in the forests of the West from time immemorial. Almost every forest area shows the effect of old fires. The influence of past fires is evidenced in the composition, form, density, growth, and yield of the forests as well as in traces of charred wood and defects on living trees. Lightning has always been a cause of fire, and doubtless the Indians used to set fire to the woods for various purposes. It can be shown that there were frequent fires occurring here and there in the forests practically every year. Occasionally there were years of great drought, when very disastrous fires occurred.

With the development of the country the forest fires increased largely in number. During the last half of the nineteenth century the western forests were very extensively burned by destructive fires. Many of the areas burned over during that time are to-day entirely devoid of living trees and are covered only with scattering trees, which are the outposts of the natural reproduction which is gradually creeping over the clearings. On these burns, particularly those of recent date, there is a great mass of fallen trees, and in some cases many dead trees are still standing. This material constitutes a great menace from new fires.

During the past 10 years there has been an effort to protect the national forests from fire. The following table shows the area per thousand acres burned over in national forests during the past decade:

<i>Fire loss in national forests per 1,000 acres.</i>		Acres.
Year.		
1901	2	<u>719</u> 1000
1902	1	<u>458</u> 1000
1903	4	<u>486</u> 1000
1904	1	<u>797</u> 1000
1905	3	<u>265</u> 1000
1906	1	<u>078</u> 1000
1907		<u>920</u> 1000
1908	2	<u>460</u> 1000
1909	1	<u>860</u> 1000
1910	22	<u>000</u> 1000

During the past season forest fires on the national forests have been the most extensive and disastrous since their establishment. There have been so far reported 4,656 fires as having occurred on the forests during the year. This does not represent the total number, because the reports from one of the districts—namely, district 4—contain only those which caused a damage of \$100 or more. It is probable that when the final reports have been received the number of fires will approximate 5,000. It is estimated that the total damage in merchantable timber, young growth, and to permanent improvements is approximately \$25,000,000. The following table shows a summary of the fires and the amount of timber destroyed, both classified by districts:

Summary of fires on national forests, calendar year 1910.

[From preliminary reports.]

Districts.	Total number of fires.	National forest area burned (acres).	National forest timber destroyed (M. B. F.).
No. 1.....	1,679	2,912,572	6,000,000
No. 2.....	709	126,933	20,790
No. 3.....	730	390,269	27,961
No. 4.....	80	166,403	196,961
No. 5.....	493	222,604	109,152
No. 6.....	965	484,704	697,799
Total.....	4,656	4,203,485	7,052,663

¹ 109,939 acres of grass fires on Kansas and Nebraska forests not included.

² 378 of the 730 fires in this district were reported for the Arkansas and Ozark forests, and incendiarianism is given as the cause of 155 of the 378 fires.

³ Only fires doing a damage of \$100 or more have as yet been reported from this district.

The exceptional number of fires during the past season was due to the fact that there was a very severe drought. While the Central and Southwestern regions were exceptionally dry, the worst conditions were in the Northwest, where the season was the driest ever recorded.

The Weather Bureau, I think, has had records from 1870, and we base that statement on those records. There were constant high winds throughout the season, which caused such fires as were started to spread very rapidly and made fighting them very difficult. In the Northwest the early spring was unusually dry, and the summer rains failed entirely. By June the forests were already very dry, and the condition grew progressively worse during July and August. Five months of continued drought with constant winds made the forests excessively inflammable. They were in such condition that the smallest spark started a blaze, which, with the high winds, soon became a conflagration, if there did not happen to be patrolmen at hand to extinguish it at its very beginning.

The forest fires followed closely the drought belt. In the Southwest many fires were reported during the spring. Although lighter than usual, the summer rains enabled the forest officers in that district to prevent serious damage through the summer. The conditions of fire protection were difficult in California and the central Rocky Mountains, but there, too, the resulting damage did not compare with

that in the Northwest. The most severe and damaging fires were in that part of the Northwest where the drought was the greatest, namely, in northern Montana and Idaho.

The causes of fires on the national forests during the past season are classified in the following table:

Origin of forest fires, 1910.

[From preliminary reports.]

Origin.	District 1.	District 2.	District 3.	District 4. ¹	District 5.	District 6. ²	Total.	Per cent.
Railroad.....	949	420	24	15	10	150	1,568	33.7
Lightning.....	229	89	83	23	103	260	787	16.9
Incendiary.....		4	163	11	53	55	286	6.1
Brush burning.....	135	17	31	18	23	60	284	6.1
Campers.....	155	70	88	3	60	75	451	9.7
Sawmills.....		3	2		9	3	17	.4
Unknown.....	211	94	294	7	161	300	1,067	22.9
Miscellaneous.....		12	45	3	74	62	196	4.2
Total.....	1,679	709	730	80	493	965	4,656	100.0

¹ Causes of fires in district 4 approximated. Number of fires reported incomplete, as those extinguished without loss were not included in the preliminary report.

² Causes of fires approximated upon ratios prevailing in districts 1, 2, 3, and 5.

Forest fires start as surface fires. When the conditions are favorable a crown fire may be developed. The majority of fires in 1910 on the national forests were put out by the forest officers before they had developed such proportions as to become crown fires. The serious damage was done by only about 15 per cent of the fires.

The CHAIRMAN. Suppose you define the difference between a surface fire and a crown fire?

Mr. GRAVES. A surface fire merely runs over the ground, burning over the leaves, needles, and debris on the ground; a crown fire runs up and actually burns through the crowns of the trees, and it is the crown fire that it is most difficult to extinguish, of course.

The most disastrous fires occurred during August in the undeveloped forests of northern Idaho and Montana. There had been a great many fires in different parts of the mountains, many of them having been extinguished, but almost daily new fires were started from one cause or another. When the climax was reached, near the end of the month, there were a large number of fires burning, but nearly all of them were under control; that is, they were trenched, and there was a body of men on guard to prevent their spread. With reasonably calm weather all of the fires would have been extinguished in a comparatively short time except a few in the high, inaccessible mountains, which practically could not be reached at all, owing to the lack of trails; but, unfortunately, on August 20 a terrific hurricane arose, which lasted about 24 hours. The wind was so strong that in many places the forest was flattened in advance of the fire and a number of the fire fighters were killed by falling trees. Every smoldering fire was fanned into life, sweeping up into the crowns of the trees, and within a few hours running entirely beyond control of the fire fighters. At one time there was an almost continuous line of fire for 100 miles, covering an area of fully a million acres.

I have a map here showing all of the fires which are large enough to put on this scale, but unfortunately on this small map you can not see all of these fires from where you are sitting. This is the district in northern Montana and Idaho [indicating on map], and this large red blotch is the area of which I speak, where there was at one time an almost continuous line of fire for 100 miles. Of course, that area was not solidly burned; we have not had time to map it all, or determine how much in that area was not killed. We can not tell until next year whether the trees which still have their foliage will prove to have been scorched or not; of course, if they were they will die when the next vegetative season starts. There were sundry fires through Washington and Oregon and California; in the Rocky Mountains there were a great many small fires, but no very large fires; and there were a great many fires in the two forests of Arkansas.

In this great fire of Idaho 76 temporary fire fighters employed by the Forest Service were killed. There were 125 persons more or less seriously injured.

There is no provision of law to permit the Government to meet the hospital expenses of the injured or the expenses of interment of the dead. These expenses were met by private subscriptions. The Red Cross contributed \$1,000, and the remaining expenses were met by contributions from employees of the Forest Service.

That simply covers the hospital expenses of the injured; they received no pay during the time they were in the hospital. The unidentified men who were killed were first buried, as they had to be, in the forest, and later their bodies were taken out and buried at different rangers' stations, and we are going to put up suitable, but simple, tablets at the graves, our own people paying for them.

The CHAIRMAN. Do you know whether claims for compensation have been filed before Congress by any of those who were injured?

Mr. GRAVES. I have a complete list of the dead as far as they were identified, and shall have a complete list of those who were injured; the estimated reasonable expenses that should be paid to the injured will amount to approximately \$10,000.

The CHAIRMAN. And it is your purpose, as the Chief of the Forest Service, to ask Congress to appropriate that amount?

Mr. GRAVES. Yes, sir; that was not in the appropriation bill, as we could not get all of the data, but there is an item in the miscellaneous portion of the bill, at the end of the agricultural bill, providing for future emergencies of this sort. But for the present relief of those who were injured and for compensating the relatives of those who were killed we will have to have a separate appropriation.

Mr. McLAUGHLIN. Did you say that the men who were killed were those who were only temporarily employed?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. And none of the regular force?

Mr. GRAVES. None of the regular force, no, sir; several of our regular rangers and guards were injured, but none killed.

Mr. LEVER. Was that due to the fact that the rangers understood how to protect themselves?

Mr. GRAVES. They were more skillful; there were several cases where men of the different crews were saved simply through the skill and nerve of the rangers.

Mr. McLAUGHLIN. Were these temporary employees volunteers?

Mr. GRAVES. No, sir; they were men who were hired to fight the fires; we had a large number of men after the fires started fighting the fires. These were hired at different labor centers.

Mr. McLAUGHLIN. Were they usually local people?

Mr. GRAVES. Local people, men who worked in the lumber woods—anyone we could find to fight the fires.

Mr. HAWLEY. What was the nature of the injuries?

Mr. GRAVES. There were a great variety of injuries; the eyes were often affected.

Mr. HAWLEY. By reason of breathing the fire?

Mr. GRAVES. The smoke and hot air.

Mr. McDERMOTT. It would affect their lungs, too, would it not?

Mr. GRAVES. In several cases, and the men received burns, of course; I do not know whether there were any broken bones or not; I have not the full data on that.

The CHAIRMAN. Were these men mostly Americans or foreigners?

Mr. GRAVES. There were a number of foreign names among those of the lost, about the average class of men you would find in a lumber camp.

The CHAIRMAN. I think you told me, in talking over this matter personally, of one instance in which 27 men—or some considerable number of men—lost their lives by reason of failing to obey orders?

Mr. GRAVES. Yes, sir. There was a crew, as I recollect it, of 60 men in charge of a competent man; the crew was split up, and one portion of the crew was sent back to their temporary camp to rest up, and the other portion of the crew was taken off for other work. As the leader went off with the second part of the crew he saw that a fire was running toward the temporary camp, and he sent back a messenger ordering these men to get out. Not appreciating the danger, they refused to do so; and they were killed.

Mr. HAWLEY. They were burned to death?

Mr. GRAVES. Yes, sir.

Mr. STANLEY. They were surrounded by the fire?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. If they had obeyed orders they could have been saved?

Mr. GRAVES. Yes, sir; if they had come immediately to the other crew they would have been saved.

Mr. McDERMOTT. Did any of the men who were lost have families?

Mr. GRAVES. Several of them, and in one case there is a widow with five small children.

Mr. McDERMOTT. Do you not think the Government ought to take care of her for a while?

Mr. GRAVES. I do; having five young children to take care of there is nothing she can do in the way of employment, and it does seem as though there ought to be some relief in those cases. The majority of the men were, apparently, single, as you frequently find men are who work in the woods.

Mr. McDERMOTT. In this particular case do you not think you ought to have a bill brought in to educate those children?

Mr. GRAVES. I am going to present this whole list of men injured and a list of the dead.

Mr. McDERMOTT. Those children are entitled to an education by the Government.

Mr. McLAUGHLIN. In cases of this kind do you arrange to have a reserve force to fight fires, a force upon which you can call in an emergency, or do you have to depend upon the situation at the time?

Mr. GRAVES. This is an emergency that never occurred before; that is, since an organized effort has been made to fight fires. It is the first effort to fight fires of this proportion. We have never had such a fire season since there was an organized attempt to control fires. We have cooperative arrangements with everyone who uses the forests in any way. We have cooperative arrangements with the railroads crossing the forests, and there is a cooperative patrol; some of the railroads have patrolmen cooperating with our patrolmen in fighting the fires which are constantly being started by the railroads. We cooperate with all the users of the forests and with the settlers, and one of the greatest benefits from the settlers in the forests is when they have telephones. We cooperate with them even in the construction of the telephones, and then, of course, have the use of them.

Mr. HAWLEY. The fires started by the railroads are caused by the sparks?

Mr. GRAVES. Yes, sir.

Mr. HAWLEY. Have you taken up with the railroads the question of having spark extinguishers placed on their stacks?

Mr. GRAVES. We have taken that up a good many times with them, but they are not satisfied with the spark arresters which are on the market. There are a number of very good spark arresters on the market, but the railroads say they can not get their firemen to fire evenly enough to get the right draft; that is the claim of the railroads.

Mr. HOWELL. Are not the railroads liable for damages?

Mr. GRAVES. There have been several cases of recovery because of fires they started, and there are several suits now on.

Mr. McDERMOTT. How much was your loss this year?

Mr. GRAVES. Twenty-five million dollars.

Mr. McDERMOTT. And the railroad companies caused a great deal of it?

Mr. GRAVES. They caused a large number of fires. On the other hand, some of them did a great deal to prevent and to put out fires.

The CHAIRMAN. Did you say that suits against railroad companies have been instituted by the Government?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Have any of those suits been completed?

Mr. GRAVES. Well, there have been a number in the past.

Mr. HOWELL. Are they inclined to pay these damages or inclined to resist?

Mr. GRAVES. They have been exceedingly cooperative. The majority of the fires started by the railroads did not do a very great deal of damage; they were put out because they had a patrolman there, and that includes our patrolman, and those fires were put out. The majority of the fires that did the damage were not caused by the railroads, so it would not be fair to take that percentage.

The CHAIRMAN. Have proceedings been instituted against railroads as the result of fires this summer?

Mr. GRAVES. I am not certain whether the suits have actually been brought yet, but evidence is being gathered and estimates of the amount of damage made. Unless the railroads are willing to settle out of court, suits will be brought.

The CHAIRMAN. And is that being done through your solicitor's office?

Mr. GRAVES. The department's solicitor; yes, sir. He has charge of all cases as soon as they are ready for initiating legal action. The gathering of the evidence is in our hands.

Mr. LEVER. I was reading a magazine article the other day in reference to this great fire; the charge was made there that if Congress had appropriated a sufficient amount with which to employ a sufficient number of patrolmen the terrible damage resulting from these fires might have been prevented. What have you to say as to that?

Mr. GRAVES. I would say this, that in order to have protection from fires you must have patrolmen, but no matter how many patrolmen you might have had during this past summer you could not have put out all those fires, because so many occurred in remote and inaccessible forests, and they could not get in there.

Mr. LEVER. I think it is charged in that article that the refusal of Congress to appropriate for the purpose of making trails and building roads made it impossible to get at many of these fires?

Mr. GRAVES. If we had begun to build roads, and the money had been appropriated a good many years ago, by this time the trails and roads would have been built. It is going to take time to develop the forests, and it takes time to build these trails and roads.

The CHAIRMAN. Is it not true that under the conditions which you described a few moments ago—extreme drought and long periods of high winds, amounting to hurricanes—any amount of money spent on trails, roads, and telephone lines would have been of comparatively little use?

Mr. GRAVES. We had high winds and had a terrible drought and put out fires in a great many forests where we had trails.

Mr. STANLEY. You speak of fires in inaccessible places where there are no trails?

Mr. GRAVES. Yes, sir.

Mr. STANLEY. How do fires originate in those places?

Mr. GRAVES. Seventeen per cent of the fires this summer were started by lightning. And then there are prospectors, campers, and hunters. Many people build fires which they carelessly leave, and those fires cause some of the fires in some regions.

Mr. LEVER. Why could not a reasonable number of men have prevented that destructive fire?

Mr. GRAVES. Simply because we have not been able, as yet, to develop our forests well enough to have them in shape to properly protect them, having these hundreds of thousands of acres to care for. Without any means of transportation or communication all of the patrolmen together could not have stopped those fires. You have got to have all of the necessary things, good patrol, trails, telephone lines for communication, and so on.

Mr. LEVER. These could be had for a reasonable amount of money and within a reasonable time?

Mr. GRAVES. I have an estimate of the construction work which is necessary for the primary control of fires. That includes 6,700 miles

of roads and 32,000 miles of trails, about 10,000 miles of fire lines, over 16,000 miles of telephone, and so on, which must be built before we have a grip on the situation. The entire list amounts altogether to nearly \$8,000,000. Now, that work can not be done in a year, and I do not think it would be desirable for Congress, if it wanted to do so, to hand over to the Forest Service \$8,000,000 in one year; I do not think we are organized so we could develop the work quite as fast as that; it ought to stretch over five, six, or eight years, but, of course, it has got to be done before you have complete access to the forests and means of controlling fires.

Mr. LEVER. You regard that as the most important work of the bureau?

Mr. GRAVES. Yes; and it must be done before we can protect the forests. It does not make any difference how many patrolmen you have, because in a wild country you can not get in and out and you can not get fire devices and equipment in, and so on.

Mr. HOWELL. Have you instituted any prosecutions against campers who have violated the law?

Mr. GRAVES. There are continually cases of that sort; yes, sir.

Mr. HAWLEY. There were probably some fires started by lightning in remote sections that did a great deal of damage and of which no one ever heard?

Mr. GRAVES. In the midst of the fire season the smoke was so heavy that even from our lookout stations it would be impossible to see very far. What we must look forward to, of course, is to prevent such a series of fires as to reach those proportions.

Mr. CHAPMAN. Have you any figures as to forest fires in other countries—Germany, for instance?

Mr. GRAVES. Yes, sir; I have visited those countries. A few years ago I took a trip in British India, where the fire problem is even worse than ours, because of the tremendous dry and hot seasons, and where they have been working on the problem for about 50 years.

The CHAIRMAN. Will you follow up that statement by a word or two about the comparative results which they get?

Mr. GRAVES. Their theory of organization is this, that they can not control the fires over all of the public forests of British India, and they began with selected forests and put those under forest protection, and then the next year they will take on a little more area, the next year a little more area, and so on. But in the meantime they have a pretty meager protective force on the areas elsewhere. In that way they are progressively working over the country and bringing it under fire protection. Their methods of work are to build roads and trails and fire lines. They have a great deal of high grass in the forests, and in many places they construct these fire lines at critical points, sometimes by simply cutting a swath through the woods and clearing up all of the material down to the mineral soil and keeping it clear, which is pretty expensive, and sometimes they merely burn, in the spring, a broad swath of 100 or 200 feet wide at the critical points or at such points as it is safe to do such burning. In that way they make fire breaks all the way through the forest. If a fire starts within those fire breaks, they can put it out. Then they have a very effective patrol.

The CHAIRMAN. As a matter of fact, you had all the money you could advantageously use this summer under the conditions that existed, had you not?

Mr. GRAVES. We exceeded the specific appropriation for fighting fires by a million dollars.

The CHAIRMAN. Where did you get that money?

Mr. GRAVES. Under the 10 per cent clause, the Secretary authorized this expenditure and is asking Congress for a deficiency.

The CHAIRMAN. Well, the entire appropriation was less than \$5,000,000, and 10 per cent of \$5,000,000 would not reach one million?

Mr. GRAVES. I think it applies to the whole department, sir; I have understood it was declared legal to incur that expenditure.

Mr. HAWLEY. So declared by some solicitor or attorney of the department?

Mr. GRAVES. The solicitor of the department; yes, sir.

The CHAIRMAN. I have understood that a deficiency appropriation of something like a million dollars will be handed to the Committee on Appropriations to replace money drawn from other funds to meet the emergency?

Mr. GRAVES. May I ask Mr. Zappone whether I have stated that correctly?

Mr. ZAPPONE. Mr. Graves is correct in part of his statement, that the 10 per cent clause was taken advantage of.

The CHAIRMAN. Is it the idea of the department that the 10 per cent covers appropriations for the entire department?

Mr. ZAPPONE. No, sir; it only covers the appropriations within that particular bureau; but, in addition to the 10 per cent clause in the agricultural act, there is a general statute which authorizes the head of any department to create a deficiency in case of extraordinary emergency, but this must be done in writing and the need must be set forth therein. He authorizes the head of the bureau involved to incur the liability, it being the understanding that the deficiency will be presented to Congress later with a copy of the written instructions of the Secretary on the subject. Both the 10 per cent clause and the general statute with regard to deficiencies were taken advantage of by the head of the department in this case. It is not exactly true, as Mr. Graves said, that he has expended \$1,000,000; I think he means that he has incurred liabilities to the extent of almost a million dollars; the actual disbursements, however, have not been made for more than about one-half of that sum, the balance being still outstanding in the way of obligations or liabilities. Within the past three days the Secretary has submitted to Congress, through the Secretary of the Treasury, a deficiency estimate for \$915,000, which is the total sum that will be needed, so far as reports already received from the various foresters indicate. For the further information of the committee I will say that under the 10 per cent provision of law in the appropriation act of this year the Secretary may add more than 10 per cent to any subappropriation in cases of extraordinary emergency. Such an emergency existed in this case, and he added more than 10 per cent to the subappropriation for fire fighting.

The CHAIRMAN. Is there included in that sum anything in the way of liabilities incurred by reason of the employment of troops in connection with these fires?

Mr. GRAVES. It is expected that that part of it will come from the War Department; the Forest Service has not included anything for the expenses incurred by the Federal troops or the State troops, the expense of the State troops having been borne by the States. Perhaps some of the governors will come forth with deficiency estimates, but at the present time I think I am correct in saying that the estimate of the Forest Service does not include any expense for either Federal troops or State troops.

The CHAIRMAN. Can you state to what extent the Federal and State troops were employed in fighting the fires? If you can do so, give us an estimate of the total expense growing out of their employment.

Mr. GRAVES. I have not the expenditures.

The CHAIRMAN. To what extent, in the way of numbers, were troops engaged?

Mr. GRAVES. I think there were 32 companies at one time, some of them detailed only for a few days, and some, I think, for a couple of weeks.

The CHAIRMAN. Were they actually employed in fighting the fires?

Mr. GRAVES. Yes, sir; they did the work of the ordinary fire fighters.

The CHAIRMAN. What number of State troops were engaged at one time?

Mr. GRAVES. The State troops, as I recollect it, were not employed on the national forests; they were employed in fighting fires which were approaching towns; they were used to save the towns.

The CHAIRMAN. Were they called out at your suggestion?

Mr. GRAVES. The governors and the district foresters got into communication at once, and in cooperation handled the whole situation; I do not know whether they were called out at the suggestion of our forest officers, or simply as a result of their combining to meet the situation.

The CHAIRMAN. Have you any opinion; and if so, do you care to express it as to the extent to which the Government ought to be liable for the use which they made of the State troops?

Mr. GRAVES. My understanding was they were used for the protection of private property in towns and were not engaged in actually putting out fires in the national forests.

The CHAIRMAN. So, according to your understanding, there would be no liability on the part of the Government?

Mr. GRAVES. I should not think so.

The CHAIRMAN. You may proceed with your statement, Mr. Graves.

Mr. GRAVES. One word about the organization of the protective force. As at present organized each forest is in charge of a supervisor. In the case of the more important forests there is also a deputy supervisor. The forests are divided into ranger districts. Each district is in charge of a ranger, assisted during the dry season by additional temporary guards. The ranger districts vary in size, ordinarily ranging from 60,000 to 150,000 acres. The area in charge of a single patrolman is on an average from 75,000 to 100,000 acres.

The forest rangers have a great deal of local business to transact in connection with the use of the forest. Therefore the ranger is not

able to put all of his time on patrol. On an average, the miscellaneous business of the forests occupies a large part of the ranger's time. Therefore the area under patrol of a single man is even larger than above indicated. The patrol force is, however, in some places supplemented through cooperation with railroads which cross the forests and with various forest users.

The patrolman rides the range. He watches camping grounds and other places where fires are likely to start. He makes use of high points to overlook the forest. In the better developed forests there are established lookout stations, some of which are already equipped with telephones.

Mr. LEVER. Will you briefly tell us what kind of work the railroad companies do in cooperating with you, as you have stated?

Mr. GRAVES. They put on patrolmen, who follow up the freight trains at slopes where they throw out a great many sparks, and if a fire is started they put out the fire; they may put out a number of fires in a single day. In addition to that, we have a cooperative arrangement for clearing the space on each side of the railroad, so as to clear up the slash and prevent the danger of a fire starting.

Mr. COCKS. Would not an oil engine preclude that danger?

Mr. GRAVES. Yes. The Chicago, Milwaukee & Puget Sound Railroad Company burns oil in going over the Rocky Mountains and, I think, through the Washington forests also, and this summer there was not a single fire started by that railroad.

Mr. HAWLEY. How far from the railroad do you do this clearing?

Mr. GRAVES. About 100 or 200 feet.

Mr. McLAUGHLIN. Does the railroad company usually have a definite right of way through the forests?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. Of a given width?

Mr. GRAVES. Yes, sir.

Mr. McLAUGHLIN. Do they pay any attention to the work of protection on lands outside of their rights of way?

Mr. GRAVES. Merely under the cooperative arrangement with our men. If a fire was started just outside of their right of way, and if their patrolmen were there and our patrolmen were there, they would go together, probably, and put it out.

Mr. McLAUGHLIN. What is the usual width of a right of way through a forest?

Mr. GRAVES. Two hundred feet on each side of the Northern Pacific and 100 feet on each side of the right of way of the Great Northern.

Mr. McLAUGHLIN. Did you say, Mr. Graves, that the Forest Service helped to clear the right of way?

Mr. GRAVES. No; we have a cooperative agreement with these roads by which these rights of way are cleared, and we cooperate in doing it; that is, they pile up the brush, and we take care of the burning of it.

Mr. McLAUGHLIN. Are those rights of way cleared to the full width?

Mr. GRAVES. A great many of them are not, and what we are going to do is to try to get them to clear the whole width and keep it cleared every year. That will go a long way in protecting the forests.

Mr. McLAUGHLIN. The clearing that is done is usually of the underbrush and more inflammable stuff, and not the timber?

Mr. GRAVES. Not the timber; the timber is not so inflammable; the clearing is of the smaller trees and inflammable material along the line. You know, after the construction is over, logs and other material are thrown over into the right of way.

In case a fire is discovered and it is possible for the patrolman to reach it quickly, he goes to it at once and puts it out, taking with him such assistance as may be necessary or he may be able to secure. If the fire is already well developed, he determines first just what force of men and equipment are necessary to handle it. He then proceeds to secure the men and the equipment. If the forest is equipped with telephone lines, he can send word very quickly for such help, and if there are roads and trails in the forest the men can be transported quickly to the fire.

If it is a large fire which will require several days or longer to extinguish, camps are established and arrangements made to supply the necessary provisions. The men are divided into crews and established along the line of fire, fighting it in such a way as is required by the local conditions. In case of large fires it is generally necessary to surround them by fire lines, and in the dense north woods it is often necessary to dig trenches 2 to 3 feet wide through the accumulation of vegetable matter to the mineral soil.

Mr. McLAUGHLIN. That would only apply in the case of surface fires?

Mr. GRAVES. In the case of a crown fire which is running rapidly before the wind, you can not do anything when the wind is blowing. Many of these crown fires die down at night, they die down and become practically surface fires, so that a great deal of our fire-fighting work is done at night when the wind goes down, or when the fire diminishes by reason of the damp air, or because of a change in the wind; sometimes the wind changes, and these men watch all of these things and take advantage of all those factors, which gives them a chance to get in and stop the fires. We stop a few of the crown fires, but we do it in that way.

Mr. McLAUGHLIN. Can you give us the amount that is used for fighting fires, the amount per acre, in some of these foreign countries?

Mr. GRAVES. Well, you can practically eliminate European countries; they have so few fires that the amount would be small per acre. I do not know whether there are such statistics, based on the average cost in Europe.

Mr. HOWELL. What does it cost, per acre, in British India?

Mr. GRAVES. I can not give that offhand; the cost of patrolmen and fire fighters is probably included together. The total cost of administration and protection is about 8 cents.

Mr. LEVER. Are the fires in Europe less frequent because of the better fire protection?

Mr. GRAVES. Well, they have their forests divided into roads and trails and into small areas; they have guards and patrolmen.

Mr. LEVER. Then it is due to better protection?

Mr. GRAVES. Oh, yes.

The CHAIRMAN. Does not the climate have something to do with it?

Mr. GRAVES. In some cases, yes, sir; in some places in the Alps there is practically no danger from fires; in some places they burn brush in the middle of summer and go away and leave the fires burn-

ing, but in southern France and Prussia, where the pines grow, there is just as much danger as in this country.

Our average expenditure for fire patrol is less than 2 cents per acre. In some forests the expenditure has been less than 1 cent per acre. This is less than is spent by certain large private owners. An illustration of the expenditures by some of the northwestern lumber companies may be seen in the following list:

Name of association.	Acres.	Rate.
Oregon Forest Fire Association.....	2,662,177	\$0.054
Cosco County Fire Patrol Association.....	37,984	.02
F. A. Kribs and associates.....	110,000	.03
Oregon & Western Colonization Co.....	100,000	.085
Whitney Co. (Ltd.).....	45,000	.014
George L. McPherson.....	25,000	.07
Southern Pacific Railroad.....	300,000	.064

There is an appropriation in the present bill of \$135,000 for fighting fires. During the past five years \$70,000 to \$80,000 a year has been ample for this purpose. It was apparent early in the summer that this would be entirely insufficient to meet the unusual conditions. The situation was, however, so serious and the danger to life and property so great that the Secretary of Agriculture gave instructions to the Forest Service to extinguish the fires at all hazards and to expend such funds as were absolutely necessary. It was the imperative duty of the Government to protect the national forests and the lives and private property which were imperiled. The table on page 141 shows the allotments to the six districts of the \$1,050,000 authorized by the Secretary of Agriculture to be expended from the appropriation for the general expenses of the Forest Service for the protection of the national forests from fire during the fiscal year 1911. This amount includes the original appropriation of \$135,000 provided by Congress for fire fighting.

The following table shows the classification of the expenditures for fighting fires:

	Per cent.
Labor.....	65
Subsistence.....	20
Travel.....	3
Transportation.....	6
Tools and miscellaneous.....	4
Total.....	100

The amount authorized by the Secretary for this emergency was \$1,050,000. Liabilities have been incurred for nearly this full amount. The balance of the allotment will be hardly sufficient for fighting the fires which will inevitably occur before the close of the fiscal year.

It is impossible to estimate accurately the value of the property which would have been destroyed if the fires had not been checked. It is certain that not less than \$100,000,000 worth of public timber was saved from destruction. It is fair to assume that under the conditions of excessive drought the damage might have extended to twice that amount if there had been no organized effort to put out the fires. This estimate does not take into consideration the private property which inevitably would have been destroyed, nor the attendant economic loss.

By far the greater portion of the cost of transportation is chargeable to the more remote fires. It was necessary in many cases to transport labor from 50 to 150 miles by rail, then by wagon road or trail, and at the end of the road or trail the men walked. Where there were no roads, pack horses had to be used. In district 1 there were at one time between 300 and 400 pack horses in service, most of them hired. In many cases supplies had to be packed 30 to 40 miles. Where there were no trails, which was the case in many instances, the supplies and equipment had to be taken on the men's backs. It has been found that 6 miles of travel on foot in timber is equal to about 25 miles by road and trail. This proportion is increased when men carry packs.

It was frequently found exceedingly difficult to secure efficient men for fighting fires. The delay in securing men and getting them to the fire line at the critical time was often the reason for fires getting beyond control.

The usual charge for labor was 25 cents an hour. The average rate for horse and saddle was \$1 per day. Packers were paid \$3 per day. These are not excessive charges for that region.

The experience during the past season has clearly demonstrated the requirements for adequate protection of the national forests. They are as follows:

- (1) A network of roads and trails for patrol and for the transportation of fire fighters and equipment.
- (2) Fire lines to supplement roads and trails as an aid in fighting fires.
- (3) A system of telephone lines for quick communication.
- (4) Lookout stations to aid in the patrol.
- (5) Ranger cabins to enable the stationing of rangers and guards at the critical points throughout the forest.
- (6) An equipment of tools for fire fighting.
- (7) In certain of the remote forests an equipment of pack trains.
- (8) An adequate force of trained patrolmen to prevent fires and to organize and direct the fighting of such fires as may be started.

Districts.	Allotment from original appropriation.	Additional allotment.	Total.
No. 1.....	\$40,000	\$674,000	\$734,000
No. 2.....	10,000	25,000	35,000
No. 3.....	10,000		10,000
No. 4.....	10,000	37,500	47,500
No. 5.....	20,000	40,000	60,000
No. 6.....	25,000	138,500	163,500
Total.....			1,050,000

I have a map of the Black Hills here, which I will pass around, which may be called one of the best developed of our forests. This shows the large number of roads. There were over 200 fires in that forest, and nearly all of them were put out; they were put out quickly and before they did much damage; all of the fires were put out by the forest officers, and the total damage was exceedingly small. I have a map of the Coeur d'Alene forest, which was one of the worst burned, where there are almost no roads and trails, and where a very large proportion of the forest was burned over.

The CHAIRMAN. Which of these two forests is in the most inaccessible country?

Mr. GRAVES. The Coeur d'Alene.

The CHAIRMAN. As a matter of policy, why would it not have been wise to develop that forest first, on the theory that the more inaccessible a forest is the more it needs development in order to afford it adequate protection?

Mr. GRAVES. That would not apply so much to this, because this does not represent the development by the Forest Service as much as the development of the country; 20,000 people live in the forest.

The CHAIRMAN. Has it been the policy of the bureau to make most of its improvements on the more inaccessible forests?

Mr. GRAVES. No hard-and-fast rule can be laid down. The improvements are needed for the handling of business as well as for protection, so that forests which are much used must have more ranger stations, telephones, etc., while the more inaccessible forests, as a rule, call for the greatest amount of trail building.

Mr. COCKS. I want to ask whether the character of the timber in the burned section was not better than in most of the other forests?

Mr. GRAVES. It was very fine.

Mr. COCKS. Would it not have been better to protect the valuable timber rather than some of the timber that there must have been in some of the other forests?

Mr. GRAVES. I question very much whether it would have been a wise policy to have concentrated protection up there and withdrawn from other districts. Protection may be very important for other reasons besides the value of the timber. For instance, in southern California the forests are mostly brush forests, there being very little timber in them, but at the same time there are millions of dollars worth of property there under irrigation; it is a fruit country, fruit districts, each dependent upon that water, and we have spent money to develop the protection of these watersheds.

Mr. HAWLEY. Have you any figures from the privately owned forests showing the cost per acre for protection from fire?

Mr. GRAVES. Yes; I have a little table.

Mr. HAWLEY. And the success they have in putting out the fires and their losses?

Mr. GRAVES. Their success was in proportion to the intensity of their protective force. Mr. George L. McPherson, owning 25,000 acres, spent 7 cents; the Whitney Co.—

Mr. HAWLEY. Have you their losses?

Mr. GRAVES. No; I have not their losses; I do not know that they had any losses, because of the small area to protect. The Oregon Fire Association, which guards over 2,000,000 acres, spent half a cent an acre.

Mr. HAWLEY. Where is their land, do you know?

Mr. GRAVES. That, I think, is an organization in northwestern Oregon.

The CHAIRMAN. Will you be able to complete your statement?

Mr. GRAVES. That practically completes my fire statement, sir.

The CHAIRMAN. We will then take a recess until Monday, at 10.30 a. m.

(The committee thereupon adjourned, to meet Monday, December 12, 1910, at 10.30 o'clock.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Monday, December 12, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

STATEMENT OF MR. HENRY S. GRAVES, CHIEF FORESTER—Continued.

The CHAIRMAN. Mr. Graves, had you concluded, at the time of the adjournment of the committee on Saturday, all that you desired to say in the way of general preliminary review of the work of your bureau?

Mr. GRAVES. I have a little more to say. I think it would take about 10 minues to set out my points.

The CHAIRMAN. Will you proceed along that line?

Mr. GRAVES. I wanted to call attention to the plans for the immediate practical work ahead for protection from fire. I spoke of the general plans which we are aiming toward in the future, and the question of what we are going to do immediately to prevent a recurrence of what happened this last summer is something which ought to be considered. I spoke of the general plan to develop roads and trails, which of course could not be completed within one year or two years, but which it would take some years, even with considerable expenditure each year, to complete. We feel that the work of construction of roads and trails, and of telephone lines and so on, should progress more rapidly than it has in the past, and there is an increase recommended in the estimates for that purpose.

The total increase in the estimates for the whole work of the Forest Service was authorized as \$500,000, and \$215,000 of that was allotted to the improvement work. We have not at the present time a large enough patrol force, and that should, in my judgment, be increased during the coming year, and we have asked for an increase of appropriation of \$120,000 for extra patrol. In making my first calculation I figured on about three months during the dry season for the average of the extra patrol, but experience during the season makes me feel that that is not enough; that we would probably on the average have to have them for four months, which would bring down the number of men who could be employed with that \$120,000 to about 400 new men.

Mr. CHAPMAN. What do you pay those patrol men?

Mr. GRAVES. By the month—\$75 a month.

Mr. CHAPMAN. They are not under civil service?

Mr. GRAVES. No, sir.

Mr. CHAPMAN. They furnish their horses?

Mr. GRAVES. Yes.

Mr. HAUGEN. How expensive are these roads per mile and how are they constructed?

Mr. GRAVES. Most of our work has been on trails and telephone lines; and the road construction, which of course is pretty expensive, we have done relatively little of. The trails, however, are laid out in such a way that they can be useful later on when roads are built—that is, the grades will be located so that the survey work will have

been done, and when the time comes that the Government is justified in building roads they can be built; so that a great deal of the survey work in the construction of the trails counts toward the later development of the forest.

Mr. HAUGEN. Is it just clearing a path?

Mr. GRAVES. No, sir; where it is in the forest we have to clear out the timber and then make a narrow tread about 3 feet wide.

Mr. HAWLEY. They are mostly horse trails?

Mr. GRAVES. Yes.

Mr. HAUGEN. For horseback?

Mr. GRAVES. Horseback and pack trains. The amount of work depends on local conditions. The trails are made wide enough so that a horse can travel with a pack of 150 pounds. These trails have cost us from \$25 to \$300, according to the work that has to be done on them.

Mr. HAUGEN. Per trail or per mile?

Mr. GRAVES. Per mile. Where the trail has to be cut through heavy timber or where there is rock work the expense runs up. I think the average expense is \$60 a mile. Is that right, Mr. Plummer?

Mr. PLUMMER. It was less than that in the past year—about \$45.

Mr. GRAVES. And the telephones cost \$50 to \$60 per mile.

Mr. CHAPMAN. Do the telephone lines go along these trails?

Mr. GRAVES. They go along the trails sometimes and sometimes right straight through the woods.

Mr. CHAPMAN. Do you cut out a trail or road for the telephone line?

Mr. GRAVES. As much as is necessary to run the telephone line straight, so as to reduce the expense of it.

Mr. CHAPMAN. Is the telephone line put on forest trees or on poles?

Mr. GRAVES. In some cases it is put on the forest trees; where the line runs right through the forest we put it on the forest trees.

Mr. CHAPMAN. And it costs \$50 to \$60 a mile?

Mr. GRAVES. Yes; on the average it will cost about that.

The CHAIRMAN. I would like to suggest to the members of the committee that all this matter with regard to the details of the improvement work would more properly come when we take up the expenditures under these items, and I would like to have Mr. Graves bear that in mind also.

Mr. GRAVES. Yes.

The CHAIRMAN. And what I would like to have Mr. Graves do now would be to proceed as rapidly as possible—we can not prolong this hearing indefinitely—to bring to the attention of the committee such general matters as he desires to discuss, and then proceed along the line of the criticisms as suggested on Saturday.

Mr. GRAVES. Yes, sir. I want to call attention to the problem of the prompt and economical transaction of our business. I have found that a great many of the complaints against the Forest Service have been due to some delays and irritations in connection with the conduct of the business, and we are aiming to perfect our organization and train our men so as to reduce those delays. In connection with the work of settlement and claims we are cooperating with the Department of the Interior so as to reduce the delays at the Washington end. With reference to the economies, the economical transaction of the business, we have found that in some lines of work the

business has cost more than it really ought to. For example, in the small sales of timber, the cost of the conduct of the sales can probably be considerably reduced, and we are working on that, and I think can accomplish that without trouble. Would you like the statistics as to the amount of timber sales from the forests?

The CHAIRMAN. Yes; we should like that.

Mr. GRAVES. During the last year the total cut of timber from the forests was 484,412,000 board feet. That includes 104,796,000 feet of timber given to communities and individual settlers, miners, etc., for free use.

Mr. HAWLEY. When you speak of timber and board feet, does that include what was given for purposes of wood or fence posts?

Mr. GRAVES. That includes both timber that is scaled and all other kinds, converted into board feet.

Mr. HAWLEY. No matter whether it is used for wood or for fence posts or for other purposes?

Mr. GRAVES. If it is not large enough to be scaled, or if it is originally measured some other way, its board feet equivalent is secured by using a constant converting factor. For instance, cord wood is converted by counting a cord as equivalent to 500 board feet. One fence post counts as 5 board feet, and one mine stull as 60 board feet. The total amount of timber sold represents an increase of about 8 per cent over the year before.

The CHAIRMAN. I wish in that connection you would insert in the hearing, when you revise your statement, a comparative statement showing the value—I do not care anything about the amount, but the value—of the timber cut in the years since the Forest Service took control of the forests, and the amount of the grazing income each year since the Forest Service took control, so that we may have right before us and in tabular form, a statement that will show the comparative business of each year.

Mr. LAMB. And let him put in the number of feet, too; that will not be much trouble.

Mr. HOWELL. That statement could show how much timber has been sold from each forest?

Mr. GRAVES. Yes, sir. That, however, would be very voluminous and a comparative statement by forests would have little value because of the changes in the boundaries and names of the forests.

The average price received by the Government for the timber sold has increased during the past year, its average being \$2.44 as compared with \$1.98 the previous year. The following table shows the cut of the different years:

Fiscal year.	Timber cut.		Receipts from timber.	Value of free use timber.	Receipts from grazing.
	Under sale.	Under free use.			
	Bd. ft.	Bd. ft.			
1906			\$60, 136. 62		
1906	138, 665, 000	182, 559, 000	245, 013. 49	\$78, 854. 45	\$514, 692. 87
1907	194, 872, 000	86, 818, 000	686, 813. 12	100, 861. 77	863, 920. 32
1908	392, 792, 000	131, 977, 000	849, 027. 24	169, 320. 07	962, 529. 40
1909	352, 434, 000	105, 205, 000	736, 102. 08	169, 081. 12	1, 032, 185. 70
1910	379, 616, 000	104, 796, 000	1, 043, 428. 20	176, 166. 51	996, 909. 88
Total	1, 458, 379, 000	611, 355, 000	3, 620, 520. 75	691, 783. 92	4, 360, 537. 67

Mr. HAWLEY. Have you any publication that shows all sales, the parties to whom the timber was sold, and the price?

Mr. GRAVES. We have not that information here in Washington. These sales are, many of them, very small sales, and the records are kept in the field.

Mr. HAWLEY. Sales amounting to, say, over \$100?

Mr. GRAVES. Those records are in the field. They are in the district offices.

The CHAIRMAN. That would be exceedingly voluminous?

Mr. GRAVES. Yes, sir; there were nearly 5,000 sales last year for less than \$100 each; there were less than 300 for amounts between \$100 and \$1,000; and only 73 for more than \$1,000. The bulk of them are small sales. There were issued during the year 20,692 grazing permits for cattle, horses, and hogs. Then, there were 4,995 permits issued for sheep and goats. This shows a decrease from the previous year of 2.75 per cent in the total of all kinds of animals grazed under permit. The total receipts from all sources were \$2,090,148.08.

The CHAIRMAN. That is for the fiscal year?

Mr. GRAVES. Ending 1910.

The CHAIRMAN. Ending June, 1910?

Mr. GRAVES. Yes; there was an increase in receipts from timber sales and a decrease in receipts from grazing, and that decrease was due primarily to the eliminations which have been made from the forests.

Mr. HAUGEN. Due to what?

Mr. GRAVES. Due to the eliminations that have been made from the forests. During the past two years they have been making boundary examinations to determine whether there were lands included in the forests that were not properly forest lands.

The CHAIRMAN. Have you a statement there of the number of homestead claims passed upon?

Mr. GRAVES. Yes; the number of tracts listed for homestead entry was 1,751, covering an acreage of 183,211 acres.

Mr. HAWLEY. How many of them were allowed?

Mr. GRAVES. Those were the ones that were actually listed.

The CHAIRMAN. Can you state how many applications were made?

Mr. GRAVES. The number of applications during the year was 5,216. A good many of those made in the winter and spring had not been acted upon at the close of the fiscal year because the summer season is when the work is done.

The CHAIRMAN. Have they been acted upon up to this date?

Mr. GRAVES. I can not tell you just how completely they have been acted upon; but the reports from the districts show that the work has been brought fairly up to date.

The CHAIRMAN. I wish you would insert in your statement the facts with regard to that, showing just how many applications were filed during the last fiscal year, how many were approved, how many rejected, and how many remain now unacted upon. I think it would be interesting also to have a showing of the length of time which usually intervenes between the date of the application and the date of the judgment that is rendered.

Mr. GRAVES. I have that material collected, but I am sorry I have not got it here. I have it in the office.

The CHAIRMAN. Suppose you insert it when you revise.

Mr. GRAVES. Yes; the statement is as follows:

Since forest homestead cases reach the Washington office only after favorable action has been recommended by the district forester, on the basis of the report made by the field examiner, it is impossible to give a fully classified statement as to the kind of disposition made of all cases disposed of since July 1, 1910. Reports classifying fully the action taken are called for regularly from the districts at the close of each fiscal year only, and to secure a special report in time for insertion in the statement to the committee is impossible. The best that can be done is to show exactly what happened in the case of all applications disposed of during the fiscal year 1910, the number of applications recommended for listing since July 1, 1910, and the number of applications made prior to July 1, 1910, which have not been examined. Even this figure can be given only approximately, since it must be obtained by wire from the district foresters; while the reports on examinations are first made to the supervisors, who must approve them before submitting them to the district foresters.

The difference between the total number of applications awaiting action at the beginning of the fiscal year 1910 and received during that fiscal year and the number accounted for is made up partly of the applications which have been rejected, partly of those which have been withdrawn by the applicants, and partly of those which are at some point between the supervisors who first receive them and the Secretary of Agriculture, who makes the recommendation for listing. Since, however, progress is rapid after the field examination has once been made, through the various stages up to final action, the most important question is how many applications received before July 1 of this year remain unexamined. The table shows that this number is 322.

Applications and listings for forest homestead entry.

Number of applications awaiting action July 1, 1909.....	3, 095
Number of applications during fiscal year 1910.....	5, 216
Total.....	8, 311
Number of tracts listed in fiscal year 1910.....	1, 751
Number of applications rejected in fiscal year 1910.....	622
Number of applications withdrawn in fiscal year 1910.....	1, 745
Number of applications listed July 1-Dec. 17, 1910.....	1, 547
Number of applications made prior to July 1, 1910, which had not been examined Dec. 17, 1910.....	322
Total thus accounted for.....	5, 987
Number of applications withdrawn or rejected since July 1, 1910, or awaiting final action following examination.....	2, 324

It must be remembered that land to be listed for agricultural settlement must be thoroughly examined on the ground, and the field investigation involves surveying, timber cruising, examination into the agricultural character of the soil, and a complete map showing topography and type of the vegetable growth on every portion of the land. When the act of June 11, 1906, was passed most of the field force was not properly trained to handle the large number of applications that were received. The situation was intensified by the fact that examinations could be made only during the open season, which was also the

time when rangers were on active fire-patrol duty and attending to timber and grazing business. As fast as possible the rangers have been trained in survey and other methods called for by the work.

Since the passage of the act of June 11, 1906, which provided for applications for the listing of land with the Department of the Interior by the Secretary of Agriculture, the average period between the date of receipt of application and date of listing has been gradually shortened, so that at the present time, except in cases where complications with mining claims, squatter claims, or rights of way are involved, the average time between date of application and date of listing is 151 days. This is the average for the entire year, and it must be borne in mind that upon the large majority of national forests applications received during the winter months can not be examined until the following spring on account of climatic conditions rendering it impossible to make a proper field examination. Lands covered by applications received during the field season are, on the average, examined within 60 days. The period between the date of receipt of report in the Forest Service office in Washington and the date of recommendation for listing by the Secretary of Agriculture is now approximately 7 days. The average time from date of recommendation for listing to the date of opening to preference entry by the Department of the Interior is 115 days. The average total time between date of application and date of opening to preference entry is 266 days.

The district foresters have been instructed to hasten the examination of lands applied for under the act of June 11, 1906, and during the next field season I anticipate that the work will be better systematized, so that the average period between date of application and listing will be very materially shortened.

Mr. HAWLEY. I would like to have him also insert the number of applications that were filed in former years which are not yet acted upon.

The CHAIRMAN. I think a complete showing of that, year by year, would be of interest. One of the criticisms against the Forest Service, you know, has been that so long a time elapsed after a man made his application before he knew whether he was on or off that it acted practically as a prohibition against settlers.

Mr. HAUGEN. What do you mean by "acted upon"? Does that mean that they have been patented or simply released from the forest?

Mr. GRAVES. When an application is made for a forest homestead it is examined by our forest officers, and if it is recommended, then the Secretary of Agriculture recommends to the Secretary of the Interior that it be opened to entry.

Mr. HAUGEN. Then what?

Mr. GRAVES. It is opened to entry by the Interior Department, which has complete charge of everything relating to the granting of the title. As soon as it is opened to entry this man files on it and proceeds just as in the case of ordinary homesteads.

Mr. HAUGEN. And generally is patent issued?

Mr. GRAVES. Oh, yes; if we recommend it for listing the applicant's case goes forward exactly like any other homestead on the public land before the Department of the Interior.

Mr. HAUGEN. Have you any knowledge as to the number of patents issued?

Mr. GRAVES. Yes; we have those statistics.

Mr. HAUGEN. Can you give the number there of claims that have been released in the forest reserves?

Mr. GRAVES. I have not the total number here.

Mr. HAUGEN. You have the number of patents issued?

Mr. GRAVES. What I gave was the number recommended to the Secretary of the Interior during the year to be opened for entry for settlement under this law.

Mr. HAUGEN. But you have no knowledge as to the number of patents issued? What I wish to inquire is, as a general thing, are these entrymen held up?

Mr. GRAVES. No, sir; not after we recommend them.

Mr. HAUGEN. They are not held up by the department?

Mr. GRAVES. The Forest Service has nothing further to do with them. I believe that in some cases it has taken nearly a year from the date of application to the opening to entry by the Department of the Interior.

Mr. HAUGEN. Well, a holdup and delay are the same thing. Now, we want to get at the delay.

Mr. GRAVES. Yes?

Mr. HAUGEN. I have a good many people in my State who are complaining about these delays, claiming that they are held up.

Mr. GRAVES. These delays are due to the Forest Service only when they arise because of a failure to get out on the ground and make the examination and get the recommendation for listing to the Department of the Interior. There is a delay which is sometimes unavoidable, but which we are trying to reduce to the minimum.

Mr. HAUGEN. That delay is with the Secretary of Agriculture?

Mr. GRAVES. That is with us. Sometimes applications will be made in the fall, and then the snows will come on, and it will be impracticable to make the examinations until next spring, so that when the field season opens there will be an accumulation to be taken care of, some of which are already almost six months old; but it is impossible in many regions, because of physical difficulties, to keep the examinations up. A man under those circumstances will complain somewhat of the delay. There have undoubtedly been times in the past when the local force has not been prepared or there have not been men enough to do the work with promptness. It is exceedingly important for us to have enough forest officers available for this work to make the examinations promptly.

Mr. HAUGEN. The average time, then, consumed is about what?

Mr. GRAVES. I shall have to speak from memory here, with the request that I may verify it by my figures; that the average length of time from the entry of the application by the applicant—

Mr. HAUGEN. That is, to the Secretary of Agriculture?

Mr. GRAVES (continuing). From the time he applies on the ground to the local officer to the time when the Secretary of the Interior is informed that the land is to be listed is six months.

Mr. HAUGEN. The average time would be six months?

Mr. GRAVES. Yes. That is my recollection.

Mr. HAUGEN. Now, the time consumed before the Secretary of the Interior, after the filing, or the uncertain or unnecessary delay, what-

ever it may be, as a general thing are these claims held up for a number of years or months?

Mr. GRAVES. Oh, no.

Mr. HAUGEN. They are acted upon promptly?

Mr. GRAVES. They are acted upon exactly like any other homestead applications before the General Land Office, I suppose. So far as our end of the work is concerned, the time should be cut down to 60 days, except where delays are due to the winter season. I can not see why, unless there is some exceptional reason, this period is not sufficient.

The CHAIRMAN. When the Forest Service was before the committee last year my recollection is that the suggestion was made that the forests be explored just as rapidly as possible, with a view to designating the tracts which should be opened for homestead entry.

Mr. GRAVES. Yes.

The CHAIRMAN. And having them on file, so that a settler would know before he went there whether his application would be approved or not.

Mr. GRAVES. Yes.

The CHAIRMAN. Has anything been done along that line?

Mr. GRAVES. Nothing has been done. I have discussed that matter in the field with our local officers, and they are all very much in favor of it. Of course it would mean a reconnoissance survey of all the forests, and it would take a number of years to do it.

The CHAIRMAN. Nothing has been done?

Mr. GRAVES. That policy has not been initiated, of making those in advance. We have had all we could do to take care of the applications as they came in with our present force.

The CHAIRMAN. A member of the committee mentioned to me, casually, that he had seen a recent circular issued from the Forest Service to the men in the field, instructing them where they were called upon to examine a homestead entry to examine the land and not the man; and the inference which this member drew from that language was that there must have been hitherto some instructions from the bureau which might have been interpreted as directions to examine the man, otherwise they would not have been specially admonished to examine the land. Will you enlighten the committee on that?

Mr. GRAVES. Yes. There never have been, so far as I know, any instructions to examine a man, but there have been cases, I think, where the local officer's judgment in regard to the possibilities of agricultural development on a given tract has been influenced by his knowledge of the physical capacity of the man to make a living on it; and it was in order to make that perfectly clear to our forest officers not to be influenced by that that we issued that order.

Mr. HAWLEY. For or against granting the permission to settle on the land?

Mr. GRAVES. Probably it would have been against him; that is, if they thought it was questionable whether the land was of agricultural value, and a man had a knowledge that this person probably could not make a living on it, he might be influenced in saying, "Well, he can not raise crops on that land."

Mr. HAWLEY. Would it not be an advantage to the Forest Service to have all available agricultural lands in the forests settled upon by bona fide settlers.

Mr. GRAVES. The value of settlers in the forest is shown in the Black Hills, to which I referred the other day, because they have roads and telephones and all sorts of things that help, and they are scattered through the forest and are a great advantage in the protection and development of the forest.

Mr. HAWLEY. And they make good bases of supplies, too.

Mr. GRAVES. They furnish bases of supplies, and they raise hay and vegetables.

Mr. HAWLEY. And they have food enough for the men for quite a time, in an emergency?

Mr. GRAVES. Yes; it is a great advantage to the Forest Service to have settlers.

Mr. HAWLEY. I know in our State the country is all broken up with mountains, and there are always large areas along the rivers that are capable of settlement, and I hope you will be able to have that land examined, so that the settlers can get in there. I know it will save an immense amount of money to the Government in the long run to have these lands, that are more valuable for agriculture than for any other purpose, settled.

Now, in your acting upon the applications or settlers, do you release the land generally so that the settlers just proceed before the Department of the Interior or the General Land Office, or do you require them to live five years under the test that used to be applied?

Mr. GRAVES. The act calls for five years. They have to live five years there to get their patent.

Mr. HAWLEY. Yes; but I mean there was once a practice in the Forest Service, if I am not in error, that before you released it you required the man to go on there five years and show that it was agricultural land.

Mr. GRAVES. No, sir; we are not doing that.

Mr. HAWLEY. You are not doing that now?

Mr. GRAVES. No, sir.

The CHAIRMAN. I should like to state a case. A citizen in my own home town had made a homestead entry in Idaho and settled upon it and planted a crop and plowed the required number of acres and proved up on the claim and had the proof allowed by the local land office. Then he was haled into court by the Forest Service on the charge that he was attempting to patent as a homestead entry land that was really a part of the forest, and it cost him some two or three hundred dollars to fight that contest, which he eventually won, and he has just about now received his patent. I assume, of course, that you do not remember any such individual case, but I would like to ask if it is common for the Forest Service to interfere at that stage of the game—after a man has made his proof before the local land office and it has been allowed?

Mr. GRAVES. No; but I should like to know of cases of that sort. Of course, if the land had really been a part of the forest, it would have been illegal to homestead it except under the act of June 11, 1906. If there is clearly an evasion of the homestead law our men report it, and there have been cases of unfavorable reports where the Land Office finally has held that the law has been complied with. But where the law has been complied with our men are not to put claimants to the expense of proving their rights unnecessarily.

Mr. HAUGEN. I would like to ask this question. How many people are now engaged by the Interior Department and the Forest Service as spies or secret-service men?

Mr. GRAVES. I do not know of any cases except where we have been endeavoring to secure evidence of incendiarism, in setting fires.

Mr. LEVER. You do not employ any spies, anyway, do you?

Mr. HAUGEN. Just let me make one statement. There are some people who have gone out from my State—and I guess there are as many who have gone out of Iowa as from any State in the Northwest—and we have a great many of these cases come up. I received a letter on Saturday from a man stating that he is now in one of these Western States, and he makes a charge about these spies, particularly, I think he says, in Colorado—you probably know something about those Western States—and the entrymen are complaining. I would like to give these people an intelligent reply.

I would like to see every man have a square deal, I care not what he is, and I would like to get at this so as to give these people some intelligent answer on the subject. I do get many inquiries, and if it is a fact that any department here holds up an honest man so that he can not make his entry, I want to know it; and if it be that every one of these men are dishonest, I want to know that. I believe they are honest men, and they have gone out there for the purpose of securing homes, and to comply with the law, and they are anxious to do it; and I am personally acquainted with a number of them, and I am free to say that I am in doubt about justice being administered to these men, and I would like to have it cleared up. Now, I would not say to the department that there is anything wrong, but there is a misunderstanding in this matter, and it is quite general in my part of the State, and I would like to know something about the people employed, and for what purposes they are employed, and what the work is, and what they are engaged in, and if it is the practice as alleged that they go to shanties, to the huts and to the women and to the children and engage in what we might call what you would term secret service, or spying. I believe there is an honorable way of going at this matter, and I believe we ought to pursue that. I am not charging the department with it, although these things have been alleged.

Mr. GRAVES. In the administration of the settlement work in the national forests we use our local force employed on the forest, the supervisors and rangers, and so on, who are regularly residents of the locality. Then we have some special examiners, experts, who assist in a rush of work and in work calling for expert knowledge.

Mr. HAUGEN. Now, these special examiners; let us find out what these men are and what is their work and what are their qualifications.

Mr. GRAVES. These men are expert in work of a special kind, who work on a number of forests, and not on one forest.

Mr. HAUGEN. How do they become experts? How? How were they selected? What is their experience?

Mr. GRAVES. They are men who understand the problems of agriculture in the case of agricultural settlement, men who are expert mineral examiners in the case of mining propositions.

Mr. HAUGEN. How did you ascertain the fact?

Mr. GRAVES. The agricultural settlement examiners are nearly all of them under the civil service, and the mineral examiners soon will be, as arrangements have been made for establishing a civil service register from which appointments may be made.

Mr. HAUGEN. How many are under the civil service, to begin with?

Mr. GRAVES. I can not give you the statistics of all of our special examiners. They do precisely the same work as our——

Mr. HAUGEN. Yes; but how were they appointed; that is what I am getting at?

Mr. GRAVES. By civil service, from the registers.

Mr. HAUGEN. To begin with?

Mr. GRAVES. Yes, but we do employ temporary men for expert work who are not under the civil service where there is a rush of work.

Mr. HAUGEN. Now, you say these special men or examiners are appointed under the civil service?

Mr. GRAVES. Yes; the regular agricultural land examiners are under the civil service.

Mr. HAUGEN. How many of them are there?

Mr. GRAVES. I can not give you the statistics without looking it up. I find there are 19 special examiners. Some of them are for mining claims and others for forest homestead applications.

Mr. HAUGEN. I will be glad if you will insert that in the record.

Mr. HAWLEY. Have you fixed any limit in your Service as to the amount of timber on a given quarter section there must be before it passes out of the agricultural limit; that is, if a certain amount is found on a given quarter section, that it is not to be taken for homestead purposes?

Mr. GRAVES. We have endeavored to find the point where the taking up of land or applying for land under the homestead act would not be for the purpose of speculation in timber.

Mr. HAWLEY. Let me state further, and then you can answer. Have you fixed upon an amount of timber per quarter section, for instance, so that when a man goes on a piece of land to examine it he can take a cruiser with him and ascertain the amount of timber that he may know whether he can secure the land for homestead purposes? Do you fix that amount?

Mr. GRAVES. We have fixed a limit locally. That limit would differ according to the value of the timber, the agricultural possibilities of the region, etc. In the case of certain valleys in northern Montana and Idaho we have fixed the amount at 4,000 board feet per acre.

Mr. HAWLEY. That would be 640,000 feet to the quarter section?

Mr. GRAVES. Yes.

Mr. HAUGEN. I would like to have him go on and explain what these men are engaged in and what their positions are.

Mr. GRAVES. In the case of the application of the homestead law, when the application is made for a homestead we send a man out to examine it, to see whether there is very heavy timber on it, whether it is on too steep a slope to farm, and what the agricultural possibilities of the land are.

Mr. HAUGEN. I have reference to these special agents.

Mr. COCKS. To whom is the application made?

Mr. GRAVES. Very often to the ranger. Now, this examination is promptly made by the ranger, but frequently we have to have expert men to help out the rangers, and these are the special examiners. We call them special examiners because they carry on a single kind of work, which they are especially qualified to handle, on a number of forests. They will work on one forest three or four weeks and then on another, and the local men may be doing the same kind of work, but not devoting their entire time to land examinations. There is nothing in the way of secret work, nothing in the way of secret employment.

Mr. LEVER. Their appointments come from the civil service, and they are men of high character?

Mr. GRAVES. Yes.

Mr. HAUGEN. How does it come, then, that these patents are held up?

Mr. GRAVES. When the reports upon them are favorable, they are not held up, except for the delay necessary in order to permit the examiner to get around. The Secretary of Agriculture of course does not list the land for settlement if the reports are unfavorable.

Mr. HAUGEN. As to the entrymen?

Mr. GRAVES. As to the character of the land; in case it is a steep sidehill with a lot of heavy timber on it, and the application is made for a homestead, it is reported unfavorably.

Mr. HAUGEN. That is, so far as your bureau goes?

Mr. GRAVES. Yes.

Mr. HAUGEN. You have no knowledge as to the Interior Department itself?

Mr. GRAVES. I have data in my office as to the average length of time it takes before the land is opened to entry by the Interior Department.

Mr. HOWELL. Do these special examiners, after the report has been given on the application to homestead the land, report as to whether or not the homesteader has complied with the law?

Mr. GRAVES. That has been reported by our forest officers, heretofore.

The CHAIRMAN. What precaution is taken, if there is a contest? Is the man who makes an application expected to go there and squat on the land until his application is passed on one way or another, or can he file a written application with the ranger, who will take it to the supervisor, who will file it in such a way that it will appear on its face to be the first claim?

Mr. GRAVES. The last is the case; and very frequently we permit him to go on the land at once and begin his improvement under a special-use permit.

The CHAIRMAN. You do not require him to go upon the land at all?

Mr. GRAVES. No, sir; but if he wants to go there and build his house and begin his improvements before the application is actually through the Interior Department, we give him a special-use permit to go on the land at once. He runs a little risk also, but it is very small, because when the land is clearly agricultural in character, the local officer is going to report it favorably, and those favorable reports go through, so there is almost no risk.

The CHAIRMAN. Just a word or two about this incendiary matter. You reported, I believe, that something like 6 per cent of the fires were probably incendiary?

Mr. GRAVES. Yes.

The CHAIRMAN. Did you get information enough to know the probable motive? Were the fires set by men who hoped to get employment in helping to put them out?

Mr. GRAVES. I think there may have been at the beginning of this last season a few cases of that sort, but the general consensus of opinion of our field men is that it was exceedingly small, the number of fires started for that purpose. It is very difficult to determine what the purpose of the incendiaries was in the other cases. In some cases, probably, it was from hostility to the administration of the forests.

The CHAIRMAN. And in some other cases it was for the purpose of, or with the hope of, extending their range?

Mr. GRAVES. Yes.

Mr. STANLEY. How about hunters starting fires?

Mr. GRAVES. A great many fires were started by careless hunters, and it is probable that the time of the open season affected that problem very seriously. That is my understanding, and that Oregon is a case in point, where they have an early hunting season and a good many fires started, which would not have started if the hunters had gone in a month later.

Mr. STANLEY. But I mean these incendiary fires; do you think any of those fires may have been started by persons burning low, brushy regions to run game out?

Mr. GRAVES. I have no knowledge of any incendiary fires of that character.

Mr. STANLEY. In the early history of Kentucky they used to burn the low cane brush and the brushy part of the forest to run the game out.

Mr. HAWLEY. When a man makes an application for a piece of land in a forest, and you send a special examiner there, do you require that special examiner to have some knowledge of the conditions of making a homestead on new land?

Mr. GRAVES. Oh, yes.

Mr. HAWLEY. He is expected to be a man that understands the problems of making a home on new lands?

Mr. GRAVES. Yes.

Mr. HOWELL. If the supervisor should turn down an application for a homestead, has the settler any recourse?

Mr. GRAVES. Yes. He can make an appeal to the district forester, and, if necessary, bring it up to me; and we will make a reexamination of the land if there is any reason to think the first decision was wrong, so that the supervisor does not have the last word; and he can take it up with the Secretary of Agriculture, and his word is final, because, under the terms of the act, the land must be listed upon the recommendation of the Secretary of the Agriculture.

Mr. HAWLEY. Who would make that examination?

Mr. GRAVES. We would send a special man for that.

Mr. HAWLEY. It would not be the same man?

Mr. GRAVES. No, sir; in certain cases where a new examination is needed because of a lack of evidence, and sufficient evidence was not secured to permit of a decision, we might send out the same man to get additional information. But in case of a dispute, of course we have the examination made by an impartial person.

An important work on our part is to cruise the timber and to determine the character and location of the different bodies of timber, so as to be able to make them known to prospective purchasers and so make them more available. This work of cruising has been carried on as extensively as we are able to, and during the last year about 3,000,000 acres was intensively cruised; that is, we have made an accurate estimate of the standing timber.

Another important line of work is reforestation.

When timber is cut from the national forests, provision is made for the restocking of the clearings by natural reproduction. The area cut over during the past year amounted to about 90,000 acres, and we may expect natural reproduction on all openings made on this area.

Throughout the national forests there are openings made by past fires. Some of these are very extensive and some are merely breaks in the forest. Through protection from fire the smaller openings are being rapidly filled by natural reproduction. On most of the larger clearings the forest is gradually creeping in from the side. Although this process is relatively slow, the aggregate area reforested naturally in this way and by the filling of small gaps in the forest unquestionably amounts to at least 150,000 acres a year.

In extensive clearings where all of the seed trees have been destroyed by fire it will be necessary to establish a new forest by artificial means. This is accomplished in two ways: (1) By direct seeding, and (2) by setting out young plants raised in the nursery.

During the last few years extensive experiments have been undertaken to determine the practicability of direct seeding and the best methods of work. During the fiscal year 1910 about 9,000 acres were reforested by direct seeding. The work has been very much extended during the current fiscal year. The detailed plans on the different national forests call for reforestation during 1911 by direct seeding of 18,500 acres. It was our hope to be able in 1912 to cover by this method of reforestation not less than 25,000 acres, but that may not now be possible because of the cut in the estimates.

The work of reforestation by setting out trees raised in a nursery has also been undertaken on a considerable scale. There are already established on the national forests 12 permanent nurseries, in addition to a number of small temporary nurseries. The total annual productive capacity of all the nurseries is about 16,000,000 plants per year. It requires several years to bring a nursery to its producing capacity. In many cases the plants must be 2 or 3 years old before using. During the current fiscal year there will be set out not less than 2,000,000 trees, which will reforest an area of not less than 2,000 acres. During the fiscal year 1912 there will be available from the nurseries about 15,000,000 seedlings. This number is sufficient to restock 15,000 acres. Our plan was, therefore, to restock by seeding and planting together during the fiscal year 1912 about 40,000 acres. That was the hope that I had to extend the reforestation.

Mr. HAWLEY. In what section of the country is this reforestation being done, chiefly?

Mr. GRAVES. In nearly every forest a certain amount of it; in at least 100 of the forests. We expect to extend the reforestation in the mountains of the Northwest. In some of the Washington forests

there are extensive burns, and that is a region where the trees grow very rapidly and where the reforestation by direct seeding or replanting is very simple.

The CHAIRMAN. Do you plan to do any planting in the Kansas and Nebraska region?

Mr. GRAVES. That work is being continued along the same lines, but the main extension of our work is in the great burns of thousands of acres in the mountains.

The CHAIRMAN. What is the purpose of your experiment in Kansas and Nebraska, merely to determine whether or not trees can be made to grow on those sand hills?

Mr. GRAVES. To determine whether they can be grown, and when the methods have been proved, to extend the work rapidly and actually establish the forests.

Mr. HOWELL. Have you any data as to the area that is cut over by private lumber companies in the entire United States?

Mr. GRAVES. I can not give you that offhand, but it is probably not far from 7,000,000 acres.

Mr. HANNA. Are the private companies doing anything toward reforestation themselves?

Mr. GRAVES. Some companies are reforesting by artificial means, but most of that work is being done by small owners—by farmers—each one of whom is planting an acre or two acres a year. I have been getting some statistics as to the result of the Forest Service in co-operation with private owners in planting. We have received replies from only about one-third of the men to whom I wrote, and these are all men who have been in correspondence with the Forest Service, and this one-third report that they have planted over 8,000 acres; that is probably in little parcels on each farm.

The CHAIRMAN. Where have those plantings been made?

Mr. GRAVES. Mostly throughout the East and the Middle West.

The CHAIRMAN. Do you know anything about what it would cost to make these plantings during the year, including all expenses?

Mr. GRAVES. The 40,000 acres?

The CHAIRMAN. The 40,000 acres.

Mr. GRAVES. The cost of planting will be somewhat less, probably, than \$10 an acre, but there will be a larger amount of money expended because of building up nurseries, collection of seed, and providing for the years following.

The CHAIRMAN. If the only purpose of that replanting were to grow trees, would it not be a better commercial investment for the Government to buy land in the eastern warm, humid latitudes, where trees grow rapidly and where you might expect a crop of merchantable timber at the end of 30 or 40 years, rather than out on the high mountainous plateaus, where you could expect a crop only in 300 or 400 years?

Mr. LAMB. Now you are talking.

Mr. GRAVES. In the Northwest, west of the Cascades particularly, and that would be true of the northern Montana and Idaho sections, the trees grow fully as rapidly as anywhere in the East, and there are one or two species that grow more rapidly and reach a larger size and give a larger yield in 30 or 40 years than any trees we have in the East.

The CHAIRMAN. Are you doing any planting there?

Mr. GRAVES. Yes. In some other sections, in the central Rockies. I think it is important to reclothe those high, steep slopes, and the probabilities are that the need for timber will be greatest in those regions where the trees grow most slowly; that is, from the standpoint of providing a local supply in the future.

Mr. HAWLEY. Do the trees you plant out live, generally? What per cent of loss do you have in the trees?

Mr. GRAVES. I can not answer that, as to what average.

Mr. HAWLEY. Estimate in a general way?

Mr. GRAVES. We have been making experiments in planting in some of the more difficult places—as, for instance, in Kansas and Nebraska and in the Southwest—in the very dry regions just on the edge of the forest, and there the percentage of loss has been pretty large, because we have not gone at it right in the beginning and used the right methods, but we are doing it now.

Mr. HAWLEY. The trees die mostly for lack of moisture?

Mr. GRAVES. For lack of moisture, but in the mountains there is no difficulty whatever, and we have a very large percentage of success, in many cases as high as 95 per cent of the trees living.

The only other thing I have, Mr. Chairman, is to report that the laboratory of forest products at Madison has been completed and is in operation and that the experimental work in testing ground woods for paper is about to be begun—that is, the building has been completed and the installation will be ready within a few weeks and that work will be commenced.

The CHAIRMAN. We will probably want to interrogate you more at length when we reach that item.

Mr. GRAVES. That is all I have.

The CHAIRMAN. Now will you proceed to let us have your statement in reply to the criticisms we called your attention to on Saturday?

Mr. GRAVES. The first was with reference to the increase in appropriation of the bill under which we are working now. I read from the record of the hearing before this committee of last Saturday:

Attention was called, for example, to the fact that while the increase of \$397,500 to the appropriation was stated to have been made in order to take care of 26,000,000 additional acres which had been added to the forests, some 14,000,000 acres of this addition were in Alaska, segregated into two forests, for which the total appropriation was something over \$26,000, whereas if the appropriation had been made in proportion to the increased acreage an appropriation of \$220,110 would have been required, and the charge was made that under cover of taking care of additional forests in Alaska we were appropriating \$220,000 for some other purpose.

I can not answer this question, except that there may have been a misunderstanding regarding the reasons for that increase. It is certain that the money spent in Alaska was in accordance with the specific appropriation for the Alaskan forests contained within the bill, and as to the rest of the increase, it was undoubtedly allotted throughout the work of the Forest Service, taking care of the increase of the business, the increase of the work, of reforestation, etc. That is all I can say about that.

The CHAIRMAN. Next?

Mr. GRAVES (reading) :

"It was further stated that the Forest Service expended \$85,000, in the language of the gentleman from the Wyoming, 'for the publication of praise of the methods of the Forest Service.'"

This refers to the charge which has been frequently made regarding the publicity work, so called, of the Forest Service. The item referred to, which actually amounted to something less than \$83,000, was to cover the work of diffusing information, which includes as an altogether insignificant part of it the special work which was done in publicity. The publicity work comprised, as far as expenditure was concerned, the employment of one man and two clerks, I believe. The expenses included also the cost of gathering certain information, the expenses of mimeographing the statements to be sent to the newspapers, and so forth. The total expense amounted during the year 1909, when this work was done most extensively; that is, the year ending a year ago, to about \$6,000. The rest of the \$83,000 was spent in the employment of men to review editorially the manuscripts prepared for our official publications, for the keeping up of mailing lists, for clerical expenses connected with handling requests for publications made directly upon the Forest Service, some expenses connected with public lectures, and with expositions in which the department took part.

Mr. HAWLEY. What was the character of such public lectures?

Mr. GRAVES. The public lectures were, in the first place, always by request. We only gave lectures by request, and generally in connection with such meetings as those of trade associations and similar bodies, many of which we were directly in cooperation with, or with whose members we are in cooperation. There were, I believe, during previous years, general lectures given upon forestry before general audiences, but the majority were before special audiences. I might go on to say, sir, that this publicity work, special publicity work, has been stopped, and all that we do now is to send out occasional items, many of which are sent directly from the department, and always with the sanction of the Secretary, who sees the items before they go out, dealing with some special matter which has been discovered or method of forestry which is of interest to the public.

Mr. HAWLEY. These lectures were always given by officers of the service?

Mr. GRAVES. Yes.

The CHAIRMAN. That was not always the case, I believe.

Mr. GRAVES. Is that so? I thought it was.

The CHAIRMAN. I remember some criticism on the floor, if not last year, perhaps the year before, of expenses which were allowed in the case of some parties who lectured by authority of the Forest Service and who were not otherwise connected with the service.

Mr. GRAVES. Under a temporary employment?

The CHAIRMAN. One case I happen to recall is that of Enos Mills, of Estes Park, Colo., who gave a number of lectures to women's clubs and other societies, collecting his fees and mileage from the Forest Service. But, of course, that was long before your administration, so that I assume you do not know anything about it; but there has been nothing of that kind done this year?

Mr. GRAVES. No, sir; there have been no special lecturers, and the addresses given were usually in connection with association meetings

or similar audiences which there is some special reason for addressing. For example, I have attended a number of association meetings of lumbermen and taken up some questions of private forestry, with a view of getting them to introduce private forestry. That is the class of lectures we are giving now, and not before general audiences.

The CHAIRMAN. None before general audiences, such as would be met by a lyceum bureau or anything of that sort?

Mr. GRAVES. It would be only in the case of a lecture in a town where some forest officer might be living, and those lectures are always sanctioned, now, by the Secretary of Agriculture, in every case.

The CHAIRMAN. And nothing is sent out from what has generally been designated as the press bureau without having first been submitted to the Secretary?

Mr. GRAVES. Everything goes over his desk.

Mr. LEVER. I have noticed that the bulletins I have been receiving from the department—ordinary Farmers' Bulletins—are now coming to me under the frank of the Forest Service or Bureau. Can you tell me anything about that, or why it is done?

Mr. GRAVES. They are probably our envelopes, with "United States Department of Agriculture, Forest Service," on them.

Mr. LEVER. Yes.

Mr. GRAVES. That is the way all of our envelopes are.

Mr. LEVER. But it struck me as peculiar that the Forest Service frank should go upon the ordinary Farmers' Bulletin.

Mr. GRAVES. I know what you refer to. There were some extra envelopes which were in danger of being gummed together; I think this was last summer?

Mr. LEVER. Yes.

Mr. GRAVES. I remember the case now. Those were sent to the department and they utilized them in that way, and I have noticed that a number of bulletins have come back which did not go to their destinations and were returned to the Forest Service. That is the case.

Mr. LEVER. Yes.

Mr. HAWLEY. You prepare some matter for the public prints?

Mr. GRAVES. Yes; bulletins and circulars.

Mr. HAWLEY. That matter is printed by them as news and not for a consideration?

Mr. GRAVES. There has never been a consideration. The purpose of the publicity work was to extend the interest in forestry, and I think it of interest to note that there has been a distinct falling off during the last year in the requests for information concerning how to practice forestry from farmers throughout the country. Whether that has anything to do with the stopping of the publicity work or not is rather difficult to say, but it is the case that we are getting about 50 per cent less requests for information on the ground and information by correspondence.

The CHAIRMAN. To what extent do you maintain a press clipping bureau in connection with this work? For example, in previous years it has been reported that the items of news sent out from the forest service appeared in the equivalent of seven or nine million copies of papers, and I wondered how that information was obtained.

Mr. GRAVES. That information was obtained partly by sending out a frank for return. But that was discontinued. I do not know just when it was, but I know we are not doing it now. There is no return frank, but we do spend about \$300 on press clippings through a contract through the department; and all bureaus, I believe, have press clippings covering certain matters of information, so that they can keep in touch with the matters of interest to the bureau.

The CHAIRMAN. Do you have a contract with any press clipping bureau to send back to you every reference they see in newspaper in the United States to the Forest Service?

Mr. GRAVES. No; only those of special interest. That, I think, is done in every bureau of the Government. I know it is in a number of the other departments.

Mr. LEVER. That costs \$300 for your bureau?

Mr. GRAVES. Three hundred dollars for our bureau. I beg your pardon; I am wrong. There was an allotment of \$300 for clippings this year; but less than half that amount is to be spent for this purpose.

The CHAIRMAN. Pass to the next.

Mr. GRAVES (reading).

It was further stated that the great timber owners of the country have been hand in glove with the Service, and it was given as a reason for that fact that the retention of vast areas of timber lands in the hands of the Government must inevitably enhance the present value of all individual holdings.

I suppose that it is true that the retention of timber lands in the hands of the Government will in some places increase temporarily the price of timber. If you threw onto the market under unlimited competition all the timber that anyone wanted to cut, that would keep the price down for a time, but later on, when it was exhausted, the price would go up very rapidly. That is an economic fact.

The CHAIRMAN. I suppose that should be discussed in connection with the further charge that sales were made to great timber companies, and also made either to companies or to individuals under such circumstances as gave them a monopoly in the particular region where the sale was made.

Mr. GRAVES (reading).

It was stated further that stumpage was sold in such manner as to virtually establish a monopoly in the lumber business in that particular region, and the case cited was that of one man who paid \$6 for stumpage when private stumpage in the community was worth \$1.50.

This was with reference to Wyoming that this charge was made. As far as I can trace the matter, the reference was probably made to a sale on the Shoshone National Forest. The timber in this case was advertised at \$3 a thousand, and that amount would have been accepted if a higher bid had not been received; that is, the sale was advertised at a minimum of \$3 and a bid was made of \$5.06. The company started to operate and found that the price was too high and threw up the sale. Inasmuch as that would have been practically the only operating company at that point, they would have had a virtual monopoly of a small area.

Mr. HAWLEY. How many bids did you receive on that particular sale?

Mr. GRAVES. I can not give you the full information regarding it.

Mr. HAWLEY. There were lower bids?

Mr. GRAVES. No, no.

Mr. HAWLEY. Just one bid?

Mr. GRAVES. As the memorandum was made for me, apparently they had reason to believe that some one else was going to bid on the timber, and, accordingly, raised their bid; but whether there was some one else to bid against them I can not say, but that was the only bid.

Mr. HOWELL. Was local stumpage in this vicinity at \$1.50 a thousand?

Mr. GRAVES. I think that that would be very low stumpage.

Mr. HOWELL. I understood that Mr. Mondell made a statement that private stumpage could be had for \$1.50, whereas the Government charged \$6 a thousand.

Mr. GRAVES. I should not think there would have been a demand for the Government timber at \$5.06, if it was possible to buy stumpage at \$1.50.

Mr. HAWLEY. Did you seek to enforce the contract for \$5.06 a thousand?

Mr. GRAVES. The contract was entered into, but the sale was thrown up, after operating about a year.

Mr. HAWLEY. Did you try to enforce the contract and get damages from the purchaser?

Mr. GRAVES. No.

Mr. LAMB. Why did you not make him comply?

Mr. GRAVES. Oh, no; I beg your pardon, I did not quite understand your question. We closed the sale after about a year.

Mr. HAWLEY. What was the reason for not enforcing the contract?

Mr. GRAVES. I can not answer that question without looking up to see what was the provision in the contract which enabled him to stop it. I find that the sale was closed because circumstances arose over which the purchaser had no control, making his operation unprofitable. It would have been harsh to have enforced the contract longer.

Mr. HANNA. Was not the Government secured by a bond, or something of that sort? Is not that usual?

Mr. GRAVES. Yes; in the larger sales we have a bond.

Mr. HAWLEY. If there are companies that are trying to force up the price locally by making bids that the smaller people can not meet, would not the enforcement of a few of those contracts against them help to prevent such attempts?

Mr. GRAVES. I do not think that is the case. I do not think that private companies are bidding a large amount on Government timber in order to raise the price of their own stumpage.

The CHAIRMAN. Answering generally, can you say whether or not the practice of the bureau is to sell to the highest bidder, regardless of whether that bidder is a great timber company or a small timber company, or an individual? In other words, do you observe any precautions at all to avoid the establishment of even a local monopoly?

Mr. GRAVES. Yes, sir; if there is danger of establishing a local monopoly we do not sell all of the timber to any one man. That is,

we take that into consideration in the size of the sale and in the area of land to be cut over, etc.

Mr. HAWLEY. Would you sell the timber at different prices, then?

Mr. GRAVES. Each case would be handled by itself, offered for sale at a minimum price, and then the highest bidder would have the sale. In the case of remote timber which requires large initial expenditures, or logging appliances, like railroads or chutes or other means of getting out the logs, the sale must be large enough to pay to cut the timber; and the large sales are of that character—that is, they are in the more remote bodies, and usually there is only one bidder. It is seldom that there is more than one man to bid on the proposition.

Mr. HAWLEY. Just aside from this question, but relating to one we have already had, in the matter of the timber destroyed or killed by these fires this summer, have you taken any steps to have it cut before it deteriorates?

Mr. GRAVES. Yes.

The CHAIRMAN. I suppose you could give us a statement, could you not, by referring to your records, showing the different number of people who bought timber during the past year?

Mr. GRAVES. Yes; the number of sales was as follows:

Number of timber sales.

States or Territories.	Under \$100	\$100 to \$500	\$500 to \$1,000	\$1,000 to \$5,000	\$5,000 to \$100,000	Total number of sales.
Arizona.....	899	9	3	2	2	915
Arkansas.....	54			1		55
California.....	495	32	11	10	4	552
Colorado.....	704	27	23	21		775
Florida.....	2					2
Idaho.....	488	50	8	18	10	574
Minnesota.....				1	1	2
Montana.....	955	31	10	21	5	1,022
Nevada.....	226	6	1			233
New Mexico.....	212	19	6	6		243
Oklahoma.....	40					40
Oregon.....	152	19	2	4	7	184
South Dakota.....	196	7	2	4	1	210
Utah.....	205	7	1	4	1	218
Washington.....	41	5	1	2	5	54
Wyoming.....	82	21	2	1	2	108
Alaska.....	174	36		1		211
Total fiscal year 1910.....	4,925	209	70	96	38	5,398
Total fiscal year 1909.....	4,625	229	53	57	16	4,980

I think we have sold about 300,000,000 feet already of dead timber.

Mr. HAWLEY. That was hurt by the fires this summer?

Mr. GRAVES. That was hurt by the fires this summer. That ought to be sold within a year and cut within three years to save it. That is the total amount. I will read further from this record:

The question was asked, in response to a suggestion from Mr. Mondell, whether any small stockmen had been rejected or their offers refused in order to give the range to the great stock companies, and the answer was, "Time out of mind."

The only case in which the applications of small owners have been rejected was when they had not previously used the range and their number was so large that the admittance of all of them would have

required a sudden and unfair reduction of the stock allowed the large owners who were prior users of the range and who in many cases had acquired valuable holdings of private property in connection with their live-stock business.

The entire policy of grazing permits has been to favor the small man, and the endeavor has been to give the small man, particularly the small man who lived near a forest, the opportunity to graze. At the same time the question of sudden changes in the grazing permits, reducing them so rapidly as to be a great hardship to an individual grazing on the forest, has always to be taken into consideration. I do not know of any unjust discrimination against small men in favor of large men. The usual complaint is the other way. Of course there are a great many small men who would like to go on the forest who can not get on the forest because there is not room for them.

Mr. HAWLEY. The complaint has sometimes been made in my section, and I have heard it in traveling, that local people who wanted some privilege of the range for their stock have not been able to get it, because large companies have bought the range up, and the smaller men in the localities who ran some stock have been compelled to reduce the size of their herds. What do you know in answer to that?

Mr. GRAVES. There is a case, I think it is referred to among the complaints, where the large owner—the large stock man—controls a long strip of range outside a national forest, over which we have no control, and it is impossible for any of the small men outside to get in through upon the forest. That is, the large man holds the key to the situation.

Mr. HAWLEY. Is it your practice to encourage the people in the locality?

Mr. GRAVES. Yes.

Mr. HAWLEY. In the matter of range privilege?

Mr. GRAVES. Yes.

Mr. LEVER. You have a discretion in that matter, have you?

Mr. GRAVES. Yes. There is a nominal fee charged, and the distribution of the range is determined by the Forest Service. It is not a question of leasing to the highest bidder, and that is the reason why the receipts from the grazing are not larger than they are. Reading again from this statement:

The statement was made that the Forest Service has spent more money in matters that do not directly relate to the preservation of the forests in the reserves than in matters that do relate to that subject. It was further declared that the Interior Department for \$350,000 protected the forests as well as they are protected to-day, with less fire loss, and that the acreage was then one-third what it is now. So at the same ratio the Interior Department for \$1,000,000 would have given protection to the present area, as against \$4,000,000 expended by the Forest Service, and that no man could say the fire protection was not as good then as it is now.

In the statement I made last week the total amount expended for protection last year was \$1,139,710.90. The rest of it went for other business on the forests, and this table which I gave shows the character of the expenditures, nearly all of which is connected with the business of the national forests. In answer to the first part of that criticism, of course it must be borne in mind that as the population increases and there are more hunters and more people in the forests, and more railroads, the causes of fires are increasing all the time, and

it needs sharper watching, and going with the development of the forests there is greater danger and more necessity for patrol.

Mr. HAWLEY. In the matter of these fires set by the hunters, we find that in our section the fires set by the hunters are mostly set by those who come in to hunt from outside of the State, and not by the local hunters. What is your opinion on that?

Mr. GRAVES. I can not answer that. I have no information as to the different character of the hunters.

Mr. HAWLEY. The local hunters are more or less interested in the locality and are careful.

Mr. GRAVES. I think that would be true in every State. The city hunters, of course, would not know as much about taking care of fire and camping as the local men.

I will read further from this statement:

A specific instance was given of alleged discrimination against a small sheepman who was compelled to go 120 miles to a summer range, when they had been occupying a range 20 miles away, and compelled to cross a State line, where they met a quarantine, and to cross a range of mountains in order to get feed.

I can not find out anything about that case. There is no record of it, and none of the men in my office are able to make out what that case refers to.

Reading further:

When attention was directed to the fact that there had been a great increase in the number of permits for grazing, it was alleged that this increase was due to the fact that large sheepmen are requested to divide up their permits, so that one would get a permit for a small number of sheep, and one herder would get a permit for another small number, and a second herder for still another, and so on, making it appear that the leasing was made to small, independent owners of sheep, when, as a matter of fact, it was merely a subterfuge and covering the case of one great sheep owner.

As the charge stands, it appears that this was done on the request of the Forest Service. That, of course, is not so; but it may be that in some cases large sheep owners have divided up and we can not discover it. Our men, however, are required to be on the careful lookout to prevent that sort of thing, and if they find any reason to suspect concealed ownership they must investigate, and also require affidavits as to the actual ownership before issuing permits. Nevertheless, I presume it might happen sometimes that a large sheepman would be interested in a number of small bands of sheep and we fail to discover the fact.

Mr. HAWLEY. Do the applicants for range privileges state that they own the stock, or do you make any inquiry as to the ownership of the stock?

Mr. GRAVES. Oh, yes.

Mr. LEVER. What would be your punishment for a man found guilty of doing that?

Mr. GRAVES. His permit is revoked.

Mr. LEVER. Both as to that particular herd, or any other herds?

Mr. GRAVES. I do not know that we have ever discovered that, but we have suspected that that might happen. It is possible that it might happen.

Mr. HAWLEY. Do you place a limit on the number of sheep you will allow any one person to graze on the forest?

Mr. GRAVES. Yes; that varies with the forest.

Mr. HOWELL. What is the largest number in any forest?

Mr. GRAVES. Do you mean the maximum permit for the number of sheep?

Mr. HOWELL. Yes.

Mr. GRAVES. In the Manti Forest, where there is a large demand for the grazing privilege, the maximum number of sheep allowed any of the present holders of permits is 1,100 head. In the remote sections, where there is very little demand for use of the range, the individual permits are much larger, and the average maximum in such forests would be from 6,000 to 10,000 head.

Mr. HOWELL. I did not know whether there was any reason for a large sheep owner to resort to that practice to get permits, under the names of his herders, if he could get them direct.

Mr. GRAVES. I will read further:

Discussing the question of the retention in national forests of large bodies of land which were not devoted to the growth of timber, or upon which no timber now exists, Mr. Englebright, of California, called attention to the fact that in the Manti National Forest, Utah, which comprises 786,000 acres, it appears from the official reports that there are 225 feet of lumber to the acre, which would make a cord of wood to about four and a half acres, so that he figures the actual value of the wood on that national forest at about 52 cents an acre. He further calls attention to the fact that upon this Manti Forest Reserve there were grazed, last year, 19,666 head of cattle and horses and 189,000 head of sheep and goats. The estimate carried in the bill for the care of that reservation was \$38,000. He speaks of another forest, which he does not name, in which he estimates the value of the timber at 33 cents an acre.

I had occasion to visit personally the Manti Forest last spring, and later in the summer took another trip through Utah into some of the other forests, so that I have personal knowledge of the conditions. On the Manti Forest there is very little merchantable timber. The forest is covered mostly with a low growth of scrubby trees and chaparral and brush.

Mr. HAWLEY. What are the trees, junipers?

Mr. GRAVES. There are some junipers there, and up in the mountains there are coniferous trees, the pines and so forth, which are characteristic of that region. There probably are very few places in the country where the conditions of regulation of the slopes are as critical as in the Manti. There is one of the worst cases of erosion and floods as the result of destroying the vegetative cover—not the timber, but the brush and grass by fires and overgrazing—that exists anywhere in the country. This is a long, narrow forest, a ridge, and on each side are canyons, at the mouths of which are small towns; and the people depend on these streams for their domestic supply of water, and also for water for irrigation. There have been, during the last 10 or 15 years, some very severe floods down these canyons, which have done a great deal of damage to the towns and the farms. These floods have been unquestionably due to the destruction of the vegetative cover. The condition now of the stream channels has been changed, and we have got what we call torrent conditions; that is, the stream channels have been deepened, not only of the main streams, but all of the side streams, and there are deep washes coming into the sides, so that the run-off of the water from the streams is very rapid, and whenever there is a storm it comes down in a flood, and many of the towns have built dams to check the violence of the floods. It is one of the worst conditions in any mountain region I know of.

Mr. HOWELL. I desire to say in that connection that the forest reservations in Utah have been mostly established by petitions of the people who are interested. There is no complaint in Utah about the forest reservations. The only protest is where there is an attempt to eliminate from the forests certain lands within the last year or two. The people everywhere throughout Utah are well satisfied with the establishment of the forest reservations and would view with anxiety and alarm any attempt to abolish the system of forest reserves.

Mr. GRAVES. I had a special investigation made of that forest with reference to the number of stock upon it and the possibility of overgrazing, and we are convinced that the number of stock which we have had since the forest was established is too large, and we have recently made a further cut in the number of stock upon it in order to protect the slopes and to protect the towns and farms and the purity of the water which the people use.

Mr. STANLEY. There has been considerable in the magazines about the practicability of domesticating deer or grazing them on slopes in regions where the grasses and the like are not sufficiently abundant to graze sheep and cattle. They say that deer, when domesticated, or if propagated as domestic animals, would thrive in those regions. Do you know anything about the feasibility of such a project?

Mr. GRAVES. That is a question that is not within our province. The technical part of that could be explained to you by the gentlemen of the Biological Survey, who have been making a special study of it, and have made that recommendation or discussed the feasibility of the plan.

The CHAIRMAN. I would suggest to the gentleman from Kentucky that this matter is discussed very thoroughly in the report of the chief of that department.

Mr. GRAVES (reading):

Discussing this same subject, Mr. Taylor of Colorado declared that of the approximately 16,000,000 acres within the forest reserves in the State of Colorado more than two-thirds are not covered by any merchantable timber whatever; he states further that 5,000,000 acres of land in his State, which is included in forest reserves, as a matter of fact is leased as grazing lands, and yet would produce, if they were used for agricultural purposes, crops worth from \$25 to \$50 an acre. He stated that he personally owned two small ranches, one of 20 acres and the other of about 50 acres, within a mile and a half of a forest reserve, every acre of which could be sold for \$300 an acre, and yet not in any way better land than some in the forest reserve. He was asked whether the land within the forest reserve was of the same character and bore the same relation to the water as the little ranches he owned, and he replied that such was the case, and stated further, "I think there are approximately 5,000,000 acres of land in Colorado that can be turned into profitable agricultural use if we can get them eliminated from the forest reserve."

That is a charge which was made at other times and other places, and it was such a serious charge that it seemed to me necessary to investigate it personally, and during this last summer I made a trip through a part of the forests of Colorado to determine whether there are within these forests large bodies of land which should be devoted to agricultural purposes which we are not eliminating. During the last summer there were some large eliminations from the Colorado forests, as I recall it, about some 700,000 acres, possibly 40 per cent of which were of agricultural character. The agricultural land was mostly in one forest, where there had been developed some water—irrigation—and this was eliminated; and there are scattered through

these forests small areas at the confluence of streams, small areas on benches, and so on, which are of agricultural character; but aside from those areas already eliminated, I could not learn of any large bodies in one place of agricultural land, and these other areas which are of agricultural value should, in my judgment, be taken up under the forest homestead act where, in order to eliminate a small area, a small farm, it is not necessary to eliminate a great deal of forest land.

The CHAIRMAN. Representative Taylor, of Colorado, has just come into the room, and I would like to interrupt you, Mr. Graves, to say to Mr. Taylor that his visit is quite opportune for the reason that, at my request, Mr. Graves has just been presenting the question of the elimination of agricultural lands from the national forests in Colorado, from the point of view of the Forest Service, in answer to suggestions which were made by yourself on the floor of the House last year, to the effect that something like 5,000,000 acres, in your judgment, of lands were erroneously included in the national forests; and he has stated that under his personal direction there have been eliminated this last year some 500,000 acres, but he does not know of any points in Colorado where there are any considerable bodies of land which are still in the national forests which ought to be excluded; that there may be small tracts here and there, but that he does not know of them. You may perhaps remember that while the bill was on the floor last year you stated that you had a small ranch in Colorado which was worth \$200 or \$300 an acre, and that there were lands within forest reservations equally good, and with practically the same relation to water as yours; and it was because of that statement that I have especially asked Mr. Graves to refer to that. If there are any questions you would like to ask him or any statements you would like to make for the information of the committee, we would be very glad to hear from you.

Mr. TAYLOR. I did not say 5,000,000 acres. That is a mistake.

The CHAIRMAN. That is the way it is reported in the Record. I read it from the Congressional Record.

Mr. TAYLOR. There are not 5,000,000 acres of agricultural land.

The CHAIRMAN. That is the way it is stated, I believe.

Mr. TAYLOR. There are only 16,000,000 acres in the whole State. When Mr. Graves is through I will make a statement, if he is through on the subject.

Mr. GRAVES. I just stated, Mr. Taylor, that I was unable to get track of any large bodies of agricultural land within the national forests which we had not eliminated. We took out a great deal of land in several forests, some of which was agricultural, but I said that there were agricultural lands in small bodies, and at the confluence of streams, in small bodies throughout the forests.

Mr. TAYLOR. I came in on another matter, and did not know anything about this matter being here.

STATEMENT OF HON. EDWARD T. TAYLOR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO.

The CHAIRMAN. Before you begin, Mr. Taylor, I will quote from the Congressional Record of February 1, in order to refresh your memory.

Mr. TAYLOR. Yes.

The CHAIRMAN (reading):

Mr. TAYLOR. I will say that I own two small ranches, one of them of 20 acres, and the other of about 50 acres, within a mile and a half of a forest reserve. I can sell every acre of that, cultivated land, for \$300 an acre, and it is not any better land than some that is in the forest reserve.

Further on you said:

I think there are approximately 5,000,000 acres of land in Colorado that can be turned into profitable agricultural land that should be eliminated from the forest reserve.

I think that covers it.

Mr. TAYLOR. The Legislature of Colorado memorialized Congress on this subject two years ago this coming winter. In that memorial the legislature stated that of the 16,000,000 acres of land within the forest reserves within the State of Colorado not over one-third was forest land. That was an official document which was sent to Congress, and was introduced and is a part of the Congressional Record. There is a large part of the forest reserve that is above timber line, and, of course, has no forest on it, but a great deal of that land is good mining territory. That is, some of our richest mines lie above timber line, and the mining people of the State feel that that is an unwarranted invasion of the mining development; that a man ought not to be supervised by a forest ranger, who usually knows nothing about mining, in his efforts to locate and develop mining property.

There is also a considerable portion of land that has been burned over by forest fires and has no timber on it at the present time, but the Forest Service announces its desire to reforest it. There is a great deal of land of that kind that is in dispute. No one can now tell what proportion of the forest reserves in Colorado will eventually be farmed. I had in mind and referred to the legislative memorial. But it seems to me futile for the Forest Service to try to work up a dispute as to the exact number of acres of agricultural land that there is within and that should be eliminated from the forest reserves and thrown open to settlement. I have repeatedly said, and everybody in Colorado, almost, I think, have complained, that there has been for many years a large part of the forest reserves that was agricultural land, and we have been hammering away at Mr. Pinchot and at Mr. Secretary Wilson for years. The result was that last spring, notwithstanding the Forest Service was always, as it is now, denying that there was any agricultural land within the forest reserves, or in any appreciable quantity, Mr. Wilson just arbitrarily, you might say, ordered 500,000 acres of agricultural land eliminated from the forest reserves of Colorado alone. When he ordered that much land eliminated they went and found it all right, and it has all, or nearly all of it, been eliminated already. I think they have eliminated practically all of it?

Mr. GRAVES. According to my recollection.

The CHAIRMAN. Do you know whether they went and found this agricultural land after the Secretary gave the order, or did they go and find it and advise him that this order might be issued, and did he then issue the order?

Mr. TAYLOR. We insist that we would never have gotten it out had it not been that we have been hammering away for years to get it out; and it was after I made that speech in the House on February 1,

and it was after Mr. Martin's speech had been made in Congress, and it was after we had been, during the tariff session, you might say, vigorously insisting on this appeal to Mr. Wilson that this order was made last February eliminating 4,000,000 acres, I think it was, all told, out of the forest reserves of the United States.

Mr. GRAVES. Yes.

Mr. TAYLOR. One-eighth of which was to be taken out of Colorado. He just ordered a lump sum of agricultural land to come out of the forest reserves in the State of Colorado. That was a great relief to us. Besides that, the bill that Mr. Mondell and I and some of you assisted in putting through, allowing agricultural entries upon the 9,000,000 acres of the coal land in Colorado was also a great relief to Colorado. Besides the 16,000,000 acres withdrawn as forest reserves, we have 9,000,000 acres in my State withdrawn as coal land. That is besides all the power sites and oil and all the other withdrawals in our State. The allowance of agricultural entries on the 9,000,000 acres of coal land has provided homes for a very large number of people. At the land office at Durango, where I was a few days ago, they said there were hundreds and hundreds of those applications coming in all the time.

Now, in relation to this agricultural land, it was announced in the Denver Times, I think it was, last summer, that Mr. Graves was coming to Colorado and that State Senator Ammons and I were going to show him over the State and show him the agricultural lands within the forest reserve. I had never made any promise of that kind. Mr. Ammons, in the presence of myself, said to Mr. Graves that he would show him, if he came out there, some agricultural lands, but as a matter of fact I did not have time last summer to put in the whole summer going over 16,000,000 acres of forest reserves looking for agricultural lands. It was out of the question for me. Mr. Graves came to Gunnison, if I recall it, and some stockman sent me a dispatch that he was going to be at Aspen the next day. I think I was trying a lawsuit or something; anyhow, I was exceedingly busy, and I could not go to Aspen. Mr. Graves got into Aspen in the evening, as I recall it, and while there was some misunderstanding about his reception there, and some friction, which appeared in the newspapers in the next two or three days, at the same time Mr. Graves came on down the valley on the following day, and I met him at the Colorado Hotel, in my home town of Glenwood Springs, and had a little chat with him that evening, and I told him I could not go with him at that time. One-fourth of our State is in forest reserves, and most of it where it is mountainous, and it is very difficult to get over.

Mr. Graves and I could not have gone over the reserves. It would require preparations for it, and it should be done by engineers and experts, and it would take them at least all of one summer to learn the agricultural lands within the reserves in Colorado. So I said it was utterly impracticable for me personally, especially when I had my own private affairs, and when I had been here most of the time for over a year, to devote the necessary time to it to go over the State with him. Besides, I learned that Mr. Graves was going straight from there over to Hayden, and from there to Denver, and from there to Salt Lake. Indeed, I think you [addressing Mr. Graves] only spent four or five days in the State, did you not?

Mr. GRAVES. It was more than that, sir.

Mr. TAYLOR. Senator Simmons met him, but I did not have time. I did this, however. I wrote letters to the county commissioners of every county in the State where the forest reserves are situated, and I said to them that I would like to have them during the summer designate to me the lands in their respective counties that they would like to have eliminated from the forest reserve, so that we could go at it in a systematic way. Some of them have answered, and others have said that there was no fund provided for them to go out and survey out this agricultural land, because it is necessarily in patches, somewhat, and isolated; and I have not up to the present time got any systematic statement of the acreage in agricultural land within the reserves of Colorado. I know there are a great many pieces of good agricultural land in the reserves; I know that there are places where they have given in their reports, where the State owns lands, and private citizens own lands, right adjoining the forest reserve, and where they are taking crops off of them, as they claim, worth from \$50 to \$100 per acre a year.

The CHAIRMAN. You know, the law provides that any citizen of the United States may obtain a homestead within a forest reserve if it is shown that the land is more profitable for agriculture than for forestry.

Mr. TAYLOR. Yes; I know the law so states.

The CHAIRMAN. Does not that take care of your situation?

Mr. TAYLOR. No; that is one of the bones of contention. The Forest Service has always insisted that a person can get a homestead. The people of our State have always insisted there is so much red tape and so much discouragement and so much delay in trying to get a homestead within a reserve that it is out of the question, and no man wants to wait or go on land and work a year for nothing. Suppose he goes to a land office and makes an application for homestead. Suppose he comes out in a covered wagon to Colorado with his family, hunting a home, and he makes an application. He may learn in 60 days or in 90 days or he may not learn in a year whether or not they will allow his application. At least, that is the practice. I think they have alleviated those conditions somewhat lately. They used to give him a temporary permit, a kind of probationary homestead; but, as I say, I think they have bettered that somewhat lately. But, anyhow, no man wants to await the whim or convenience of some ranger to decide whether or not he thinks the applicant can make a living on that land. A homesteader wants to go to the land office and pay his little \$16.50 and get his receipt for his money and go on his land and go to improving it. He does not want to have to wait for an application to go to Washington before he can be permitted to start work; he does not want to have to wait for someone to determine whether he will allow him to get that piece of ground or for some ranger appointed from Boston or some place to decide whether he can make a living there.

The CHAIRMAN. Since you mention that, is it not a fact that the rangers are generally taken from the localities where they do their work?

Mr. TAYLOR. Some of them are lately, but a great many of them formerly were not.

The CHAIRMAN. I understood it was the policy to do that.

Mr. TAYLOR. No, sir; under Mr. Pinchot's administration, the first two or three years, I think, most of them came from Georgia. At any rate, a good many of them from the South and back East. There was at one time considerable complaint about carpetbaggism. But I think that they are changing that under the present rules.

The CHAIRMAN. I know that it has not been possible for me at any time in the last five years—and I have tried it several times—to get an appointment to the position of ranger for any of my constituents, the reason being always given that they wanted to appoint a man from the State in which the forest was located.

Mr. TAYLOR. I think they are changing that a good deal; but I do think they are young men who are not experienced, very often, in either mining or in what is good agricultural land. But I insist that it makes no difference whether they are or not; if a man comes to Colorado and wants to settle upon a given piece of land to make a home, it is the policy of this Government that he should be permitted to do so, and our State wants to encourage that kind of agricultural settlements, and we do not want to have them delayed for 90 days or for a year in determining whether or not they will be permitted to file upon it. That is an obstacle to people coming there and making homes. Home seekers come there and look over the State, and find a piece of desirable land, but they find it is in a forest reserve. If a man succeeds in getting a piece of that land it may be five years before there is a neighbor that can get permission to locate in his locality. He does not want to be isolated way off by himself. But if the land is thrown open and anyone can settle and go to the land office and file on it, and nobody can prevent him, we can build up our State much faster.

Now, I want to say to you gentlemen, and I want to say it as hard as I can, that there is no one in Colorado who wants to interfere with the preservation of the timber or the forests, but we do believe, and we can prove, that it takes from 400 years to 1,000 years to grow a 3-foot tree at an altitude of from 8,000 to 11,000 feet, and nobody wants to wait 1,000 years for a tree to grow. We know that that land will produce timothy and hay and other crops to great advantage. There are some people who have promised to send me some of the products of their ranch that they have raised at an altitude of 9,000 feet, and they say that they have matured as good vegetables and potatoes as are raised anywhere, and have raised the best timothy hay in the world; and we believe that that kind of land should be without hindrance put into agricultural cultivation, and that people should be permitted and invited to make homes upon it, rather than withhold it from entry under the pretext of reforestation in those altitudes where a tree only grows from three to four months in the year, and only about five or six hours in the day during that time, so that it is really absurd to talk about reforestation in that country. But nearly all the land that we want opened to settlement is below 9,000 feet. We want that land put into homes; we want it put into permanent residences; and when a man wants to come there and stay, we want him to have that opportunity.

We do not believe that the quarter or half a cent an acre which the forest reserve gets for grazing stock upon these forest reserves should be tolerated for a moment when people want to make homes and make a living and grow crops there that are worth from, say,

\$25 to \$100 an acre, a year, on the rich soil that is in the Colorado reserves.

The CHAIRMAN. Of course, this committee entirely agrees with you on that entire proposition, and the committee has insisted that just as rapidly as possible all land that was obviously more suitable for agriculture than for forestry should be eliminated from the forest reserves.

Mr. TAYLOR. Yes, sir.

The CHAIRMAN. And we have been assured from year to year by the Forest Service that this was being done just as rapidly as possible.

Mr. TAYLOR. Will you allow me to ask you a question? Was not this committee assured just as strongly two years ago as you are to-day that there was no agricultural land in the forest reserves; before Mr. Wilson ordered that 500,000 acres of land taken out, and which has just recently been taken out in spite of all their protestations that there was none there?

The CHAIRMAN. No; I do not think the representatives of the Forest Service ever came before the committee and said that there were no agricultural lands in the forest reserves. They have always, on the contrary, admitted that there were such lands in the forest reserves, but they have always given the impression that those lands were in small tracts within the forests, and that they could be taken for homestead purposes under the law that is provided for such cases.

Mr. TAYLOR. Mr. Chairman, I think the general sentiment of the country is that the agricultural lands ought to be allowed to be settled—

The CHAIRMAN. Nobody questions that at all.

Mr. TAYLOR. No sensible person ought to.

The CHAIRMAN. The only proposition of interest immediately to the committee right here was the question as to whether you had in mind, whether you could call to Mr. Graves's attention, any individual cases. It would seem, from the broad statement which the record quotes you as making that there were 5,000,000 acres of land in the forests which ought not to be in the forests; that some of those lands must be in large tracts, and it must be a matter of general knowledge to the people of Colorado, where they were, and we thought perhaps you could give the information to Mr. Graves, which he does not seem to have been able to obtain from any other source.

Mr. TAYLOR. The tracts of agricultural land in the forest reserves are not in large bodies. You know that Colorado is situated on the crest of this continent. It is just a network of mountain streams and valleys and mesas running both east and west. The western half slopes toward the Pacific and the eastern half toward the Atlantic. The tillable lands are mostly in comparatively small patches. There is much brush and quaken aspen land that could be cleared and become rich farming land.

The CHAIRMAN. Now, I will tell you what this committee has been urging the Forest Service to do, and what it is entirely willing to do just as fast as it has the funds; that is to follow up the work of the past summer, and send these cruisers and surveyors and special agents all through the forests, and eliminate these agricultural lands just as rapidly as they can. I received, and I suppose you did, dur-

ing the summer from the Forest Service little bulletins from time to time, giving notice that a certain area had been eliminated from a certain forest, showing that that work has been proceeding during the past year.

Mr. TAYLOR. Yes; those eliminations were parts of that 500,000 acres that Secretary Wilson ordered out. I just received a very vigorous protest from Denver this morning about this matter. Some time ago I stated to a newspaper reporter here in town, and it went out to the Denver papers, that if there was any land in the State of Colorado that really ought to be included in the forest reserves, and that was not, if the county commissioners and local people who are interested in the vicinity of this land would request it, I would include it in a bill to add it to the forest reserve.

I had in mind two townships in La Plata County that I spoke or wrote to you [addressing Mr. Graves] about last spring. I think, Mr. Graves, I thought, and still think, it is unnecessary for Congress to repeal the present law. President Taft recommends the repealing of the law which prevents the President from increasing the forest reserves in six of those Western States, including Colorado. We have that law now. I tried to retain that provision in the withdrawal bill when it passed the House last spring, but I was defeated in the House; but the Senate put it in, and it is there now. Now, President Taft wants that restriction repealed. I said it was wholly unnecessary so far as Colorado was concerned; because if there was any more land—which I did not believe there was, but if there was any more land—in the State that ought to be in, I would agree to put it in. The result is I immediately get a vigorous protest from Denver this morning. They want to know what I mean by consenting to put any more land in the forest reserves in our State. They say: "For God's sake, we have already got nearly two-thirds of our State in the reserves of various kinds, and we thought you would be the last man in the State to agree to do anything to put any more in the forest reserves." I simply made the proposition to counteract the recommendation of the President. If any appreciable number of Coloradans can show that there are any tracts of lands in our State that ought to be added to any forest reserve, I would much rather agree to assist in trying to put them in than to permit the repeal of the present law and make it possible for the President without notice to put any or all of the rest of our State into a forest reserve.

I do not for one moment believe that there are any more lands in Colorado that the State at large would be benefited by having in a reserve, but if there are any such and that fact is satisfactorily shown to me I will introduce such a bill and I have no doubt the conservationists in the House would gladly assist me in securing its prompt passage.

Mr. STANLEY. You speak of the fact that trees will not grow above the forest line.

Mr. TAYLOR. Trees will not grow above about 11,000 feet. That is what is called the timber line, and above that there are no trees.

Mr. STANLEY. That line is comparatively well defined?

Mr. TAYLOR. Yes, sir.

Mr. STANLEY. Do you think it would be advisable, by an act of Congress or Executive order or otherwise, to eliminate from the for-

est reserves all that region that is above the timber line? Could not that be done?

Mr. TAYLOR. It could be done.

Mr. STANLEY. Would not that be a sufficient boundary for them to follow, pretty well defined?

Mr. TAYLOR. No; it is not the land above the timber line we want out as much as it is the land below that will raise good crops. Above the timber line there is no vegetation except small brush and a little grass; but they do mine about timber line. It is a strange freak of nature that some of the richest mines are away above timber line, at an elevation of 12,000 or 13,000 feet. There is nothing up there to destroy. As a matter of fact, there is no reason why it should be in the forest reserve, but the Forest Service wants it in there, as they claim, for the conservation of the water, which belongs to the State.

The CHAIRMAN. There is no particular reason why it should be out, is there?

Mr. TAYLOR. No; we are not complaining about the reserves above timber line. The only thing is, if they would not interfere with prospecting and mining we would not care. I have never asked to have that taken out. All that I ask is that the forestry officials keep their hands off and not interfere with mining development. The mining does not interfere with forestry; and even if it did, the mining is much more important than the forestry. It is the agricultural land and the land that can be put into crops that we want the people to have free access to locate.

The CHAIRMAN. The committee quite agrees with you on that proposition.

Mr. TAYLOR. I thank the chairman and the committee for its patient hearing.

The CHAIRMAN. The time has come for the committee to adjourn.

(At 12.45 o'clock p. m. the committee took a recess until 2 o'clock p. m.)

AFTERNOON SESSION.

The committee met pursuant to taking a recess at 2 o'clock p. m., Hon. Charles F. Scott in the chair.

STATEMENT OF MR. HENRY S. GRAVES, FORESTER—Continued.

The CHAIRMAN. If you will be kind enough to proceed along the same lines you were on before the committee adjourned, we will try to have you conclude your observations in a general way, so we can get at the details of the bill as soon as possible.

Mr. GRAVES. There is only one other of the charges which was incorporated in the Record, referring again to what was designated as the "scandalous extravagance of the Forest Service." Mr. Mondell questioned the need of \$44,000 for typewriters in one year. Other attacks, as the committee will remember, were made along the same general lines. That was the last of the points you brought up. In reply to that I will say that in addition to the typewriters needed in the Washington and district offices, not only is each supervisor's office necessarily equipped with a typewriter, but there are also a number of rangers who have been furnished typewriters, because economy of

time and good business methods call for their use. The ranger's cabin is furnished with a little simple equipment by the Government, consisting of a plain table, two chairs, a filing case, and, in the case of the rangers who have the most important business to transact, they have been furnished with a typewriter.

The CHAIRMAN. Do the rangers have reports to make?

Mr. GRAVES. Many of the rangers have a good deal of correspondence with the users of the forests, as well as papers to fill out and reports to make.

Mr. HAWLEY. Are they required to keep copies of their letters?

Mr. GRAVES. They are required to keep copies when they have typewriters. When they have not a typewriter, they are not required to do so. It is a matter of importance to have copies. They have also their reports to make—fire reports and reports on other lines of work—and we have found that not only do their reports come in in very much better shape, and their correspondence is in very much better shape, but the reports themselves are better; they take more pride in them, and the results seemed to justify furnishing typewriters when we felt they were capable of handling them.

The CHAIRMAN. In buying typewriters in so large numbers, you might say almost by the hundred, do you know whether they get any reduction from the retail price?

Mr. GRAVES. They are open to bids for typewriters; the Forest Service is not furnished with the cheapest typewriters, because those are typewriters which in many cases are apt to get out of order, and so we have not always taken the cheapest ones that were on the market.

The CHAIRMAN. I understand, of course, that you would buy a standard typewriter, but I wondered whether even in such a case you could get them below the retail price.

Mr. GRAVES. I think so; but I can not tell just what the reduction is without looking it up. I think the Oliver typewriters sell for \$72.90.

Mr. HAWLEY. Do the rangers take good care of the typewriters? Is that your experience?

Mr. GRAVES. Yes. They seem to take a great deal of pride in that little equipment. The men I have visited personally take very good care of them.

The CHAIRMAN. Does that conclude what you have to say in a general way?

Mr. GRAVES. Yes, sir

The CHAIRMAN. I wish you would turn to the estimates, page 36. This statutory roll is much longer than it was last year, and as far as I have observed the increase in a number of clerks is due in every case to the transfer from lump funds.

Mr. GRAVES. Yes, sir.

The CHAIRMAN. These transfers are made at the same salaries?

Mr. GRAVES. Yes, sir. There is a note on page 40 to that effect—about the middle of the page.

The CHAIRMAN. On page 38 I notice that you have altogether about 33 draftsmen, whose salaries range all the way from \$900 to \$2,000. I wish you would state briefly the reasons for the necessity for employing so many draftsmen, just what they do, and just the reason why there should be so wide a difference in their salaries.

Mr. GRAVES. In reference to their work, we are developing maps of the national forests as an aid to their administration, maps showing the resources of the forests, graphic representations of the statistics of the resources of the forests; maps which show the distribution of the timber, the status of the land on the forests, etc. That work is being pushed as rapidly as possible, and when the field data is secured it is put on maps. We have a considerable force in Washington, and then in each of the district offices there are a number of draftsmen who make maps in the field and then send them in to Washington, and some maps are made in the district offices and then sent back to the forests. The work is concentrated. The work in connection with the examination of the boundaries of the forests, the elimination of agriculture and grazing areas from the forests, has required a great deal of map making. With reference to salaries, Mr. Plummer, who has charge of the work of the offices here, is here, and may I ask him to state the reasons for the difference in salaries?

The CHAIRMAN. Certainly.

Mr. F. G. PLUMMER. The drafting work consists of three different kinds. The most difficult of it is the compiling. We have a class of men of whom is required the very highest skill, who are capable of taking the data from the Land Office and that from the Geological Survey and from the Coast and Geodetic Survey and placing all that information on one map according to our standard scales and legend. Another class of draftsmen are capable of taking a map which has already been completed and make a necessary change in it in order to conform to an amended proclamation. Still another class of draftsmen are simply copyists; they are given the rough drafts which are prepared by the compilers, or the higher class of draftsmen, and simply make a tracing of that for the lithographers or the photographers. So there is quite a wide range, from \$2,000 down to \$900.

Mr. HAWLEY. At the top of page 38 I find two items there for game wardens. What do you have game wardens for?

Mr. GRAVES. In the case of one of the men, Frank Rush, on the Wichita Forest—the Wichita Forest is a game preserve, is it not, Mr. Plummer?

Mr. PLUMMER. Yes.

Mr. GRAVES. There is no supervisor on that forest and this man Rush simply has the title of game warden on this forest, which is also a national game preserve, and he acts as a supervisor.

Mr. HAWLEY. What is the other one?

Mr. GRAVES. In the case of the other game warden, I don't recollect what his name is. It is a similar place. He is not a State warden, but a national forest officer charged with care of a national game preserve.

Mr. HAWLEY. The game really belongs to the State?

Mr. GRAVES. Yes, sir; usually. But there are several national game preserves, as for instance the Grand Canyon National Game Preserve in Arizona. They were established by Congress.

Mr. HAWLEY. These two men are really supervisors?

Mr. GRAVES. Yes, sir; they have really nothing to do with the State game wardens.

The CHAIRMAN. I thought I understood you to say this morning that you paid your rangers \$75 a month.

Mr. GRAVES. No; those are the guards. Those are the extra men we take on during the summer. The entrance salary of assistant forest rangers is \$1,100.

The CHAIRMAN. And you advance them by seniority, do you, or some other merit system?

Mr. GRAVES. Merit; merit practically entirely.

The CHAIRMAN. And what is the highest salary?

Mr. GRAVES. I think the highest salary as ranger is \$1,500 per annum. These have been on the miscellaneous roll and have been promoted from time to time for efficiency.

The CHAIRMAN. Are they appointed through the civil service originally?

Mr. GRAVES. Yes, sir; a ranger examination.

The CHAIRMAN. What are they furnished in the way of equipment or any other thing which would contribute toward their expenses?

Mr. GRAVES. They are furnished, in the case of those who are required to live at a remote point, with a cabin, and one other perquisite, horse feed, after they have expended \$75 on horse feed themselves. That is, they furnish a horse or horses, as the case may be—in some cases we require them to furnish two horses—and they furnish the horse feed up to \$75, and after that the Government contributes. In some cases, I may add, the salary of the ranger has been influenced by the cost of living in the country. For instance, in Alaska we have to pay rangers more than we do in some of the States.

The CHAIRMAN. You have one item here for seven chiefs of maintenance at \$1,600 each. What is the duty of a chief of maintenance?

Mr. GRAVES. He is practically a chief clerk. He has charge of all matters of quarters and the messengers, and the providing of supplies for the offices, etc.

The CHAIRMAN. What is the duty of one chief of distribution?

Mr. GRAVES. He has charge of the requests for publication and of sending out such publications as are distributed by the Forest Service to its own force, and also of the printing of forms, etc.

The CHAIRMAN. You have two or three artists. What do they do?

Mr. GRAVES. The artists color maps, and we also have several who assist in making illustrations. For example, just at present we are getting out one of a series of publications on the trees of the country, "Trees of the Rocky Mountains," and we have an artist who is preparing cuts of the botanical characteristics of the trees, for illustration.

Mr. HAWLEY. Trees to be represented in colored plates?

Mr. GRAVES. No; they are represented as cuts, showing the cone and the seed and the foliage, to assist people in determining the different species.

The CHAIRMAN. What occasion have you for the service of four or five photographers?

Mr. GRAVES. We have a great deal of photographic work, both pictures and blueprints of maps, plans, etc. We have cameras which are furnished to field agents. The photographs are used for our information and study and also for illustrations in our publications. They are also used in making up our reports. For example, in the reports on applications for agricultural land they use photographs to

show the character of the country. Then we have a photographic collection which shows the character of the national forests and of other forests throughout the country, for general use in our work.

The CHAIRMAN. You have one lithographer. Do you have a lithographic press in your bureau?

Mr. GRAVES. I will ask Mr. Plummer to state just what our co-operation with the Geological Survey is.

Mr. PLUMMER. We have an arrangement with the Geological Survey by which our lithographic work is done; but in order to proceed with the smallest expense and the greatest haste we make the transfers, as they are called. We have a map which is to be placed on stone and printed. Our photographer makes a wet plate and our lithographer makes a transfer and takes it in his tin case down to the survey and presses it on the stone and makes such corrections as are necessary, and the printing goes on. In that way we save at least one-half of the time and considerable of the expense.

The CHAIRMAN. Have you any printing office at all in the bureau?

Mr. GRAVES. We have a small press at Ogden. That is our supply depot, and we do some printing there.

Mr. HAWLEY. You do no printing here in Washington?

Mr. GRAVES. No, sir; it is just a little press we have there.

The CHAIRMAN. If there are no further questions on the statutory roll we will turn to the general expense account.

First, I notice you ask us to increase the limit of cost for building from \$500 to \$1,000. May I inquire why that is thought to be necessary?

Mr. GRAVES. That is a matter of experience. Of course the cost of the buildings is variable according to the distance which the material has to be hauled, and we found it was exceedingly difficult in many cases to complete a building which was large enough to afford a home for the rangers. Our feeling is that we want to have these rangers located at the right points, scattered through the forests. Of course there are no houses there that they can rent, and we put up these buildings and we want a building so that the ranger can take his family up there and live. In many cases it is impossible to construct a building which would be suitable for that purpose for the amount heretofore allowed.

Mr. HAWLEY. Do you make the buildings out of sawed timber or do you make them out of logs?

Mr. GRAVES. Out of both, sir. I have brought some photographs of our ranger stations, and on the back I have indicated which ones were built under \$500 and which ones were more than \$500. Those which were constructed for over \$500 were constructed several years ago before the provision of the limitation of \$500 was placed upon that.

Mr. HAWLEY. That hardly answers my question. I asked whether they were made out of sawed timbers or logs.

Mr. GRAVES. Both. At the remote points out of logs.

Mr. HAWLEY. In the item of expense, does that include the ranger's time? Does he assist in the building of the cabin?

Mr. GRAVES. Yes.

Mr. HAWLEY. It includes an estimate of his time?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. You insert language at the bottom of the first paragraph, "including the maintenance of nurseries." As a matter of fact, you have been maintaining nurseries, have you not?

Mr. GRAVES. The purpose of that was to make the language sufficiently clear so that there could not be any question about the use of rangers' time in the work of reforestation. The special item for collection of seed and reforestation is on page 46, \$166,000, near the bottom of the page. That is not sufficient to cover all of the reforestation which we would like to do, and as it makes a specific appropriation for this work it might be held to prohibit expenditures for reforestation from other appropriations. If we can use the rangers' time incidentally in maintaining the nurseries and in collecting seed and in planting, then we can carry out our program more economically and without a further increase for reforestation. It is my hope that you would permit us to include such language in this item as would give authority to charge the ranger's time against this item when he is doing nursery work or collecting seeds.

The CHAIRMAN. Have you consulted the Solicitor or any other legal authority to determine whether that authority is implied under the present language?

Mr. GRAVES. Mr. Zappone can probably answer that question.

Mr. ZAPPONE. He was consulted, and he thought that if the provision were left under the paragraph providing \$166,000 for reforestation, it would preclude the opportunity of securing the services of the rangers on this work, which is very necessary throughout the forest, as I understand it. In other words, the amount for this purpose would have to be very largely increased unless they could use the rangers not only for general work, but to assist in reforestation. We passed upon the language as it has been inserted here.

The CHAIRMAN. I did not know that the duties of forest ranger had ever been sufficiently defined, or so clearly defined, by legislation, either upon this appropriation bill or elsewhere, as to warrant any question about the right of the bureau to employ them in reforestation work if it was thought best.

Mr. GRAVES. And being charged against the general expenses—

The CHAIRMAN. Certainly; charged against the individual forest.

Mr. GRAVES. Yes; and against the individual forest.

The CHAIRMAN. Take it with the appropriation in the form it is during this current year, and where you had, for example, the Alamo National Forest of New Mexico, \$36,449, it never occurred to me but what part of that money might be used in paying the salary of a ranger there, no matter how he was employed.

Mr. GRAVES. There seemed to be sufficient question, so we wanted to be on the safe side and have the language express it.

The CHAIRMAN. Of course the reason we question all these things is because we get into trouble every time we change the language of a bill.

Mr. ZAPPONE. If I may be allowed another remark, the change is also intended to put ourselves straight so far as the accounting officers of the Treasury are concerned. Under the item "reforestation," as it originally stood, all the work of that character would be confined to that item, for the accounting officers, including the Comptroller of the Treasury, have held that a specific appropriation is exclusively applicable to any particular object or item of expense

included therein; or, in other words, that such expense can be incurred only under that item. Therefore the question arose as to whether expenses incurred by the ranger in assisting in this reforestation work might possibly be subject to some criticism by the accounting officers of the Treasury, and we thought that by introducing that additional language the matter would be perfectly clear.

Mr. GRAVES. Mr. Chairman, as the language stands it confines its work—that is, of the rangers—to the maintenance of the nurseries, and I would like very much if you decide to put that language in, “including maintenance of the nurseries,” to add the words “collecting seed and planting.” That is page 40. That would enable us to carry out, I believe, the program of about 40,000 acres for 1912 with this appropriation.

Mr. HAWLEY. I would like to ask about this change in the cost of limiting the building. How do you arrive at an estimate of a thousand dollars?

Mr. GRAVES. That is a maximum; that does not mean that every building would cost a thousand dollars, but there might be cases where a building would cost \$550 or \$600, or more, and so we ought to have a higher limit.

Mr. HAWLEY. Why do you double it? Why not say \$700?

Mr. GRAVES. That would probably cover nearly all the ranger stations.

Mr. STANLEY. I notice all the buildings you have pictures of are constructed at approximately the maximum sum.

Mr. HAWLEY. It seems to me a thousand dollars for the construction of any building in the midst of a forest, out of logs, is a high cost.

Mr. COCKS. How far do you have to bring the sawed stuff? I suppose they have got that on the ground?

Mr. GRAVES. We usually put in floors and doors. They have to be brought in some cases a long distance.

Mr. HAWLEY. Do you make your floors out of sawed stuff?

Mr. GRAVES. When possible, yes. It saves a great deal of labor.

The CHAIRMAN. Do you feel you ought to include in the cost of this building the wages of these rangers who are employed while they are building it?

Mr. GRAVES. Of course a great many times we secure extra labor to help us in constructing those where the ranger has a great deal to do and he has not much time to put it on himself.

The CHAIRMAN. And in other cases in which the ranger does employ his time, do you charge his expense during that time?

Mr. GRAVES. My understanding is that his time is charged.

Mr. HAWLEY. Have you ever taken estimates from local carpenters or builders as to what they would put up this building for?

Mr. GRAVES. I don't know whether they often endeavor to make a contract or not. Some are built on contract, but I think, as a rule, we have found we can get better results by doing the work ourselves.

Mr. STANLEY. In the event a ranger charges up his time to this expense here, as a matter of bookkeeping, and he is also paid a salary, what is to keep the Government from suffering nominally a double charge?

The CHAIRMAN. I do not understand that he is paid a salary at the same time that his salary goes on; he is paid the same salary whether

he works at building this house or at some other duty. The only difference is that if he puts in a month, we will say, building a house his salary for that month is charged in against the fund provided for the salaries of the rangers put against the building. I understood that to be the statement of Mr. Graves.

Mr. STANLEY. I see.

Mr. GRAVES. The time of the ranger is counted in estimating the cost of the building. The actual money expended in addition to his salary might be only \$300, or something like that; but in determining the cost of the building the limit is \$500.

Mr. RUCKER. His salary stops then for the time he is working on the building?

Mr. GRAVES. No, sir; but we draw \$300 from the permanent improvement fund for the extra labor and the transportation of boards and that sort of thing; but the total cost of the building, including the ranger's time, would not exceed \$500, while there was only \$300 perhaps drawn from the permanent improvement fund. That is the way you understand it, is it not, Mr. Zappone?

Mr. ZAPPONE. Yes; we try to arrive at the definite cost of the building, including the salary of the ranger. You [addressing Mr. Graves] do not pay his salary out of the amount you set aside for buildings, but you estimate that so much of his time is taken for that purpose; the total cost of the building, including the estimated salary, is kept within the definite limit of \$500. Now you wish to extend that limit to not to exceed \$1,000, although the average cost, as you say, will not exceed \$700.

The CHAIRMAN. We come now to the item on pages 41, 42, and 43. It will be observed that the estimates seek to change the system of appropriations for the maintenance of the various forests so that instead of making a definite appropriation for each individual forest the appropriation shall be made for the different districts. Members of the committee will have very poignant memories of the conflicts we have had on the floor in years gone by because of the appropriation in large lump sums for the support of forest service. It was to meet that criticism that last year, at our request, the chief of the Forest Service presented his estimates in the items formed providing a separate appropriation for each individual forest, and that change met with very evident approval when the bill came before the House. I hope that Mr. Graves will be able to give us some cogent reasons why it should now be changed and the other system should be resumed.

Mr. GRAVES. The first reason is that the supervisors, the deputy supervisors, rangers and clerks in the forests, the whole force with the exception of such expert special men as might be detailed from time to time in the forest, special examiners and others, are now on the statutory rolls. We feel very strongly that it would be a great embarrassment to have statutory salaries for each forest. The supervisors of the force have been transferred at their present salaries to the statutory roll. The present salaries are the result of promotion from time to time, so that a given salary of a supervisor, for example, on a given forest now would be based on the man who happens to be there now rather than on the work of the forest, the size of the forest, and its responsibilities. We have to-day considerable variation in

salaries. In two forests of the same value and volume of business we have supervisors with different salaries, and we frequently find it necessary to transfer supervisors from one forest to another, and if there were a fixed salary on given forest that would be an embarrassment to us.

The CHAIRMAN. We did not have a fixed salary for a given forest in the bill which is the current law; we made a lump sum appropriation for each forest, permitting the bureau to expend that appropriation as it desired. Now, if men who heretofore or who at the present time are carried on a lump-sum fund and paid out of the appropriation enacted for a given forest are transferred to the statutory rolls, I do not see any particular reason why the amount of their salary should not be deducted from the appropriation for the forest in which they were formerly employed, and that appropriation still made in a detailed way as it is this year.

Mr. GRAVES. If that were done it would leave for each forest merely the general expenses of the forest after the salaries of such clerks, rangers, and supervisors as there might be were deducted.

The CHAIRMAN. Exactly. Why could not that be done? You have now provided in this bill upon the statutory rolls for all the supervisors it is necessary for you to employ; there is not anything in this bill requiring you to assign any given supervisor to any particular forest; you are at absolute liberty, so far as the language of the bill is concerned, to assign them to any forest that you may want to, to one forest one method and another another; if that fits with your policy, and I do not see any particular reason—of course I am anxious to get your point of view—but I do not see any particular reason why it would not be entirely satisfactory to simply deduct from the appropriations for the individual forests the amount of money which at present is used in paying the salaries which you propose in this bill to transfer to the statutory rolls.

Mr. GRAVES. There are two points there which I would like to mention that influenced us in not doing that. That would leave sometimes a comparatively small sum on each forest for our general expenses. Our experience this year, working under this bill, is that we have been a good deal embarrassed in some cases by the lack of elasticity when later conditions, which were not foreseen, made it desirable to put more money on a given forest in various work than we had anticipated.

The CHAIRMAN. I can understand how that embarrassment might come the first year of the new plan, but with the experience of one year to guide you would not you be able to distribute your fund amongst the various forests so that with a 10 per cent leeway which the law allows you you would have sufficient elasticity?

Mr. GRAVES. The probabilities are that we would not suffer nearly as much another year as we have the first year, of course.

Mr. HAWLEY. Has not the practice of allotting so much money for each forest proven satisfactory in the past?

Mr. GRAVES. It has never been done but one year and that was this year.

Mr. HAWLEY. Have not we made an appropriation for each forest heretofore?

The CHAIRMAN. This current year was the first time it was ever done. He was saying it embarrassed them somewhat, but I was

inquiring whether it was not due to the fact that it was merely an experiment.

Mr. HAWLEY. I was wondering whether you could not take these sums appropriated for the district and apportion them to the various forests in the district.

Mr. GRAVES. It would be entirely possible to make that distribution—

Mr. HAWLEY. Why would it not be possible to allot each district—the several forests within each—a certain sum of money for their maintenance?

Mr. COCKS. That is what was done.

The CHAIRMAN. Suppose we let Mr. Graves continue and present all the points he had in mind as justifying this change.

Mr. GRAVES. I wanted to illustrate how plans may sometimes change. The work of cruising may be an example. We might not anticipate the need of extensive and relatively expensive cruising on a given forest. That is work which is going to take a long time, to cover all forests and cruise all timber, and there might be developed a demand through some railroad construction or otherwise that would make it desirable to make an extensive cruise of a forest after we had given in our estimates.

Mr. HAWLEY. Would not the 10 per cent leeway you have, allowing a transfer from the entire appropriation for this work to any one forest, produce sufficient funds for that?

Mr. GRAVES. Well, if you had general expenses of \$7,000 on a given forest, 10 per cent would make \$700, and that would not cover very much of a cruise.

The CHAIRMAN. But where it runs up into two or three million dollars, I think our statute would permit you to divert 10 per cent of the entire aggregate appropriation for all the forests to be expended on one forest if the Secretary of Agriculture, in writing, should authorize it; and this bill would carry some two or three millions for all the forests, and so you could divert a very large amount—two hundred or three hundred thousand dollars for one forest.

Mr. GRAVES. Of course, if there is that elasticity, that would meet that objection. The other point was one of accounting, and Mr. Zappone is here, and he could speak of that question with the greatest simplicity.

Mr. LAMB. I should think that would be a difficult question.

The CHAIRMAN. We will be glad to hear Mr. Zappone on that.

Mr. HAWLEY. Before Mr. Zappone replies I would like to state my problem again. In each of the districts there are included a number of forests.

Mr. GRAVES. Yes.

Mr. HAWLEY. And it would seem that if after each district, as given on page 46, there were then inserted below the forests and opposite them the apportionment to that forest a certain amount of money, it would enable us to legislate much more wisely and obviate serious problems of legislation in the future. The experience heretofore gained, it would appear, is that you could make the allotments, and you would not be embarrassed this year because of the possibility of the transfer of 10 per cent from the whole appropriation for maintenance of all forests to any one or two several forests as need might arise.

The CHAIRMAN. Before Mr. Graves answers may I ask this: What would be the advantage of the system you propose over that which prevails in the present law; what is the advantage of having the forests grouped under half a dozen different districts over having them set out individually?

Mr. HAWLEY. I accepted the plan they apparently devised of districting them so as to have one general supervisor or officer over a number of forests. I accepted that plan which they thought most advantageous for administration purposes too.

The CHAIRMAN. We will hear what Mr. Graves has to say about that.

Mr. GRAVES. I should not think that would be any different from our standpoint than your plan, Mr. Chairman. It would not make the items any more elastic.

The CHAIRMAN. No; what you have done now, as a matter of fact, with an individual appropriation for each individual forest has been to administer them through district headquarters.

Mr. GRAVES. Yes.

The CHAIRMAN. And it would not only help you any to be obliged to chop up your appropriation into 20 or 30 different items merely by placing those items under the nominal head of one district?

Mr. GRAVES. Because there would in any case be a specific appropriation for each forest.

The CHAIRMAN. Yes. Before Mr. Zappone responds I would like to ask whether you have now in your own bureau an account with each one of these individual forests?

Mr. GRAVES. Oh, yes.

The CHAIRMAN. And you have expended your appropriation under those different accounts?

Mr. GRAVES. There were several forests where I think the first estimates were a little bit too large, and others where they were too small, and I think the result of that probably was that work was initiated on those forests where they had more or less slack which would not have been initiated if there had been more elasticity about taking that money and putting it over where it was more needed.

The CHAIRMAN. Do you know how many additional clerks you are obliged to employ in order to carry on this system of bookkeeping made necessary by the change?

Mr. GRAVES. I can not answer that.

The CHAIRMAN. Mr. Zappone, can you answer in regard to that?

Mr. ZAPPONE. I don't think I can except to approximate it. I should say that it requires at least five more clerks to look after the additional bookkeeping, and I have no doubt that the change suggested in the estimates of this year will simplify the bookkeeping very much.

The CHAIRMAN. Well, will it reach any practical results so far as the accounting is concerned further than the elimination of four or five clerks?

Mr. ZAPPONE. That will be about all. We can continue carrying out the subdivision idea that you gentlemen arranged for the present year. There are about 150 subdivisions, each one of which has to be carried through our books as a separate appropriation, while the Treasury Department carries the aggregate under one general head.

They do not subdivide it. The accounts have to be transmitted on separate abstracts to show from what lump appropriation the expense has been incurred.

The CHAIRMAN. Were these additional clerks appointed in your office or in the Forest Office?

Mr. ZAPPONE. In the Forest Service.

The CHAIRMAN. How does it affect the work of your office?

Mr. ZAPPONE. It has increased the administration part of it. I have examined those accounts and I would say that it has added a couple of clerks to my work.

The CHAIRMAN. You say then that this system of subdividing appropriations perhaps rendered necessary the employment of seven more clerks?

Mr. ZAPPONE. Seven, including two for headquarters at Washington.

The CHAIRMAN. Their salaries would be in the neighborhood of \$1,200 each?

Mr. ZAPPONE. Yes; on an average. As Mr. Graves says, the one misleading thing about the whole matter is that when all clerical places are transferred to the statutory rolls under the provisions of law in the current bill, the remaining amount set aside for each forest is so very, very small that it certainly would not mean anything to this committee or anything to the Members on the floor of the House. Suppose the amount set aside for a certain forest this year is \$10,000 and in the estimates we have transferred a sufficient force from that forest to reduce the amount to \$3,000. That \$3,000 would mean nothing to you. You might say, "Well, there are a certain number of places on the statutory rolls that probably belong to that forest," but you could not pick them out.

The CHAIRMAN. Well, it does not mean anything to us this year; but say there was an appropriation of \$3,000 made for the maintenance of this particular forest; if next year we should come in with an appropriation of \$6,000 for that particular forest, we would be put on notice that there had been a hundred per cent increase added, and we would inquire of Mr. Graves what had made it necessary. Members of the House who are following the matter up would be able to inquire from the committee to ascertain what made this increased appropriation necessary, and in that respect it would be of some value, I think.

Mr. ZAPPONE. Still, that might not properly designate it, either. Say you added \$3,000, so it was made \$6,000; you might have added to statutory roll several clerks for that forest.

Mr. HAWLEY. That would not appear next year in the appropriation for maintenance.

Mr. ZAPPONE. No; that would not appear there. Your maintenance fund would remain the same.

Mr. HAWLEY. And it would enable us to ascertain and satisfy ourselves and the House as to the reason for the expenditures of money and for increases of expenditure from any particular fund.

Mr. ZAPPONE. It would tell you the cost of maintenance, but that would be all; and maintenance is a small part, certainly not over 50 per cent of the expense, because the total force that has been transferred in these estimates amounts to over \$2,000,000.

The CHAIRMAN. Yes; but is it not of some value—and perhaps Mr. Graves can answer this better than you can—is it not of some importance to the Forest Service itself to have an individual account with each forest just as a careful farmer will open a book account with a certain 40 acres of land he has? He wants to know what his different fields are bringing him year after year.

Mr. LAMB. You do that anyhow.

The CHAIRMAN. And he will open an account with the various subdivisions of his farm. It seems to me it would be interesting to the Forest Service to know just how each forest was getting along in a financial way.

Mr. GRAVES. We have a very complete system of allotments and liabilities, all of which, although carried in this appropriation, are administered by the office of accounts. All of the accounting clerks in the Forest Service are under Mr. Zappone. That whole system has been transferred to him.

The CHAIRMAN. If you keep that kind of a system, I do not see why it would not require just as much bookkeeping as we are providing for in the present law. If you keep an accounting system with each forest, crediting it with the income derived from it and charging it with the expense involved in its maintenance, I should think it would involve just as much bookkeeping as the present law calls for.

Mr. GRAVES. I will have to ask Mr. Zappone to answer that.

Mr. ZAPPONE. The chairman is pretty nearly correct in that. The Forest Service would still require that information in order to know how its liabilities stood, but I would not need it in the actual accounting work.

Mr. GRAVES. We do carry that in our liabilities.

Mr. ZAPPONE. Yes; and you probably will require that next year.

Mr. GRAVES. Oh, yes; even when there was a lump sum.

Mr. ZAPPONE. It really, then, would not make a very great saving in the matter of bookkeeping. I must admit that I overlooked that you would require that part of it.

The CHAIRMAN. Have you from the beginning kept that kind of an account with each forest?

Mr. GRAVES. My understanding is that this system of allotments and liabilities was introduced in 1906.

The CHAIRMAN. Can you tell from your books how much a given forest has earned and how much it has cost?

Mr. GRAVES. Oh, yes; we have those statistics.

The CHAIRMAN. So you are really keeping that?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. You have books on that system now?

Mr. GRAVES. Yes. May I ask, Mr. Chairman, whether or not the matter of information to Congress could be secured if it were presented with estimates just as the miscellaneous roll is presented?

The CHAIRMAN. Well, that is hardly practicable. We can not include the estimates in the bill; we must deal with the law as it is in the statute books.

Mr. HAWLEY. I understand you keep an account with each forest?

Mr. GRAVES. Yes, sir.

Mr. HAWLEY. And with the proposal submitted in your preliminary remarks for the expenditure of some eight millions in the near future in constructing roads, trails, and otherwise for the protection

of forests, the maintenance and expense account is going to very materially increase, and will probably in the years to come be the greater part of this appropriation for the forest work; that is, so far as the amount we appropriate is concerned. Now, if each year when we are making our appropriation we have a list of forests under each district, the amount appropriated last year, and then the amount estimated for the ensuing year with the increases, we can legislate, it seems to me, with greater advantage and furnish the House with information they will surely demand as the years go on, much better than we can now, and which, under these lump funds, we will be compelled to dig out piecemeal in order to get the necessary information to make the required answers to the inquiries that are sure to arise from the floor of the House.

Mr. GRAVES. If there are increases in the construction work, speaking of that \$8,000,000 item for ultimate development, that will be carried in a separate fund, a separate item.

Mr. HAWLEY. Would a certain amount be allotted for the construction work in each forest?

Mr. GRAVES. It will be allotted in our office, but it will be required in the appropriation bill as a separate fund, as it always has been, I suppose.

Mr. HAWLEY. Why not allot for the construction and maintenance of roads and trails in each forest in making the appropriation, including in the appropriation all the items that go into the cost of administering the forest?

Mr. GRAVES. That would be a matter which I suppose would lie primarily with this committee. If they wanted to have it done that way, we could present the estimates in that way.

Mr. HAWLEY. It seems to me we would have an advantage. We would always then have before us the total cost of the forests purposes.

Mr. LAMB. That would be interminable; we could not do that.

The CHAIRMAN. Allow me to ask you this question:

Under the present law, itemized as it is, have you expended any of the money appropriated for the general expenses of a given forest for the construction of trails or the building of telephone lines?

Mr. GRAVES. That has come from the permanent improvement fund that is specifically appropriated for.

The CHAIRMAN. For instance, the Alamo National Forest, of New Mexico, for which there is an appropriation this year of \$36,443; did you spend any part of that sum in the building of trails?

Mr. GRAVES. No, sir; that came out of the \$275,000.

The CHAIRMAN. Well, do you think you would have been authorized to do it under the law?

Mr. GRAVES. There seems to be some question about that, sir.

The CHAIRMAN. I think the only question that arises would come from the fact that heretofore we have specifically, in a separate item, provided for permanent improvements, but I am inclined to think that if we did not do that particularly, if we put into the language of the paragraph at the very beginning of general expenses a word or two which would authorize the construction of permanent improvements, then any amount of money which could be diverted to that purpose might be legally used for it.

Mr. GRAVES. Yes, sir; I think there would be an advantage in that.

The CHAIRMAN. Have you found it necessary as a matter of administration to change the boundaries of the districts materially?

Mr. GRAVES. Not the boundaries of the districts very much. We have had to change boundaries of forests occasionally.

The CHAIRMAN. Well, would it be any serious matter to have your districts tied up so you could not change them without a change of the law?

Mr. GRAVES. No, sir; but that has worked an embarrassment in some cases in the changing of the boundaries of the forests. We would have to wait until next year to change one when for administration reasons we might find it desirable to change it sooner. Frequently we want to change the boundaries and throw a portion of a forest into another administrative unit.

The CHAIRMAN. I understood you to say that you did not see any advantage to be derived from the administrative standpoint in having the appropriation made so as to set out the individual forests by districts over the present system; that is to say, if we were going to itemize the sum for the individual forests, you would just as leave have it in the form it is now, and, indeed, would prefer it to be in the form it is now rather than to have it set out by districts.

Mr. GRAVES. I really can not see very much difference whether the forests are arranged alphabetically in a series or grouped by districts. It might perhaps be a little clearer for those who are familiar with the different portions of the West to have them by districts.

The CHAIRMAN. Well, I would like to make a few general observations.

Members of the committee will remember that year before last the bill was presented to the House itemized as the estimates now provide, on page 46, making the appropriation by districts rather than by individual forests, and it excited so much criticism that the committee insisted the year following that Mr. Pinchot must itemize by forests. Now we are asked to go directly back to the old system, which we ran away from, after only one year's experiment with the new, and I am very much disposed to think that the committee ought to request Mr. Graves to distribute his fund among the forests, so that we can present the bill in the same form it was last year, eliminating from the appropriation for each individual forest the amount of the salaries which are carried to the statutory rolls.

Mr. LAMB. I reckon that would be best; if we didn't we would have a fight on the floor. While I don't think they have anything to do with it, and they ought to leave it to us, they won't leave it to us.

The CHAIRMAN. Well, the House will not be satisfied, and as one member of this committee I would like to see the system tried out a little longer. I can understand how it was extremely difficult to distribute this enormous sum of money, without any previous experience, in such a way as to meet the necessities in every individual case; but with the experience of one year to guide them it seems to me that Mr. Graves and his associates ought to be able to distribute this amount of money to the individual forests in such a way that with the 10 per cent leeway they would not have any difficulty at all in administering it, and I am very much inclined to think that it makes for good administration to have this great sum broken up into items as far as it can be done.

Mr. LAMB. They can certainly do it if the basic principle of their work is fixed right—if they know approximately what it is going to cost for each one of these forests.

The CHAIRMAN. Well, Mr. Graves has told us that it has been the practice for years to keep the debtor and creditor account with each individual forest, and, that being so, it seems to me that the appropriation might properly be made along that line; and while we are not passing definitely upon the details of this bill, yet in order that there may be no delay, if the suggestion meets with the approval of the committee, I would like to have action taken that would request Mr. Graves—

Mr. LAMB. We will take that up in executive committee, will we not?

The CHAIRMAN. The only thing about it is that I thought if it was practically the unanimous opinion of the committee now that we ought to make the appropriation that way, we could so advise Mr. Graves and he would be able to present it to us in the form we desire before we pass to the executive consideration of the matter, and then we could consider the various items.

Mr. HAWLEY. In order to get it before the committee, I move that Mr. Graves be requested to allot to the several forests the amount he thinks necessary for maintenance during the coming year, eliminating the amount contained in the statutory roll.

(The question was taken, and the motion was agreed to.)

The CHAIRMAN. The motion prevails, and you will please consider this a request to take that action.

The action just taken by the committee, then, will eliminate all the language in italics relating to the various districts, on page 46, and we come, then, to the item for fighting forest fires, in which there appears the new language, "and insert infestation." Under what item have you been carrying appropriations for infestation?

Mr. GRAVES. We have been doing a little of that work under general expenses, and there are occasionally, in fact there are now, a number of very severe infestations, and we thought to have it specifically mentioned in the appropriation bill would be wise, in order to meet very violent infestations which would require the expenditure in one place of more than could be obtained from the general expenses of a given forest. For example, it might be necessary, in order to meet an insect infestation, to spend \$10,000, and out of general expenses for the forest that would not be enough.

The CHAIRMAN. Are you not likely to know long enough in advance to make an estimate of where such an expense will be necessary, so you can provide for it in the appropriation for the individual forests?

Mr. GRAVES. Sometimes these insect infestations are not discovered so far in advance as that. Our men are not expert entomologists, they are local men, and to locate them we are working in connection with the Bureau of Entomology for this information. Very frequently we suddenly discover that if we could go in at once and spend \$5,000 we would stop the infestation where it might cost \$10,000 or \$20,000 or more later on if we allowed the infestation to extend.

Mr. HAWLEY. How much did you expend for that work this year?

Mr. GRAVES. We are expending \$5,000 the current year, which is in eastern Oregon, where there is a very serious infestation.

Mr. HAWLEY. What insect are you having trouble with there?

Mr. GRAVES. The bark beetle. It started in the lodgepole pine, and until that was pretty well killed out it did not attack the yellow pine, but now it is attacking the yellow pine.

Mr. LEVER. Is not that a thing for that Bureau of Entomology to handle?

Mr. GRAVES. We are cooperating with them, but they have no specific appropriation for it. It is on a national forest. We use their expert knowledge to help the technical side.

The CHAIRMAN. I see you have added nothing to the appropriation of last year for fighting forest fires and other emergencies.

Mr. GRAVES. No, sir.

The CHAIRMAN. Would the language "other unforeseen emergencies," do you think, cover any expenditure made necessary by insect depredations?

Mr. GRAVES. I think it would.

The CHAIRMAN. Then those words are really not necessary there—"insect infestation.?"

Mr. GRAVES. Probably not.

The CHAIRMAN. Passing to the next paragraph, "For the purchase and maintenance of all necessary field and laboratory supplies, instruments, and equipment," you recommend \$198,080, which is some \$23,000 below the appropriation for the current year.

Mr. GRAVES. I think, Mr. Chairman, that the total appropriation for this item is the same as last year, but this is what is left after deducting the salaries on the statutory roll—all of the men who handle our supply depot—so the appropriation is not reduced.

The CHAIRMAN. Does it not appear as if \$221,000 or even \$198,000 is a pretty large sum to be appropriated annually? I can understand how it might be needed in the beginning, when you are just equipping and supplying your various stations, but all the stations that you have are equipped now, are they not?

Mr. GRAVES. More equipment is needed every year, because the first equipment was not a complete one. There are such matters as forest instruments, surveying instruments, and others used in the field work. For which there has never been a very complete equipment. For instance, some districts would only have one or two fully equipped transits.

Mr. LAMB. How many stations are there?

Mr. GRAVES. There are six districts.

Mr. LAMB. And how many stations?

Mr. GRAVES. There are 152 forests, I think.

Mr. LAMB. Then this 152 has to be divided by this 198.

The CHAIRMAN. Did you make any sort of a detailed estimate of the requirements for the coming year?

Mr. GRAVES. Yes; and while it is pretty difficult for me to tell whether the estimates for paper and envelopes and gum and things like that are absolutely necessary, I went over these estimates with a great deal of care, especially the instruments, the surveying instruments and forestry instruments, calipers, etc., and I am certain that the estimate is not excessive. I found one item which might be questioned, and that is some additional typewriters for the field. We will need some typewriters for replacement of some of the older ones—typewriters which were sent out some years ago—and for equipping new offices, but I think that this item could be cut down—that is, we

could get along without as many as estimated; but that is the only item that I could see there was a possibility of cutting down.

The CHAIRMAN. In the purchase of all your supplies I suppose you advertise for bids?

Mr. GRAVES. Yes; that is all handled in the regular way, as in other departments.

The CHAIRMAN. About what is the estimate for typewriters?

Mr. GRAVES. Well, I think it was about \$7,000. There was an estimate for a hundred typewriters.

Mr. COCKS. I think only about two years ago we spent about \$40,000 for typewriters.

Mr. GRAVES. Yes; I spoke of that in the opening of the session.

The CHAIRMAN. The next paragraph, for investigation of methods for wood distillation, etc., seems to be eliminated. Have you completed those investigations, or is it your intention to—

Mr. GRAVES. No, sir; we have changed the wording of that.

The CHAIRMAN. Oh, it is in the paragraph following?

Mr. GRAVES. In the paragraph immediately following, so as to combine the testing for paper, etc., making that one paragraph.

The CHAIRMAN. Where is the other paragraph?

Mr. GRAVES. There is a special paragraph on page 47 for the testing of such plants and woods as may require test to ascertain if they are suitable for making paper. That is combined with this.

The CHAIRMAN. And this new paragraph is simply a combination of those two and does not involve anything new?

Mr. GRAVES. That is correct; but there is an addition to the appropriation.

The CHAIRMAN. Well, the appropriation for the first paragraph is \$129,220 and for the second it was \$14,000.

Mr. GRAVES. There is an addition of \$58,400 suggested.

The CHAIRMAN. Why is so much more needed this year than last?

Mr. GRAVES. Merely the extension of the work. We have a laboratory now, and possibility of doing more work, which we would like to do.

The CHAIRMAN. Have you accomplished any new results in the matter of wood distillation this year?

Mr. GRAVES. Almost all of the experiments in wood distillation, timber testing, timber physics, etc., and in fact in nearly all those lines, are a continuation of the experiments, and a good many of the results are just coming to a conclusion and will be published this winter and spring. We are going to begin to issue very rapidly bulletins in regard to that work.

Mr. LAMB. Is not this work being duplicated in other places?

Mr. GRAVES. I will explain one point about that in a moment.

Mr. ZAPPONE. A special item of about \$30,000 for paper testing is included in the sundry civil bill.

Mr. GRAVES. There was \$30,000 appropriated as a special item in the sundry civil bill for ground-wood paper tests, and that work is now organized, and the total expense for paper tests, including the paper investigations, for which \$14,000 is appropriated this year, will amount together to about \$30,000 next year.

The CHAIRMAN. How much of the \$30,000 carried in the sundry civil bill have you expended or will you have expended by the end of this year?

Mr. GRAVES. We will have expended the whole; but part of that will have gone to the equipment of a building, machinery, etc., for the investigation.

The CHAIRMAN. As I understand it, you have not actually done any work under that appropriation yet?

Mr. GRAVES. No; a building has been constructed for us at Wau-saw, Wis., for this work, and given to us at a very reasonable rental. The installation of that building with the necessary electric and other machinery, with the various grinding stones, etc., which will be used in the investigation, should be completed by the 1st of January; so we will have had six months' work of actual investigation during the year.

Excuse me, but I think Mr. Lamb asked me a question.

Mr. LAMB. I asked you if this work would not be duplicated.

Mr. GRAVES. The only possible duplication of work—and I think there has not been any so far but there is danger of it—is in the Bureau of Chemistry. The Bureau of Chemistry is carrying on some investigations with reference to turpentine and other extractives of wood. I want to say that Dr. Wiley and I are arranging together for coordination of that work and cooperation, so as to avoid duplication, where the law permits us so to work along the same lines.

The CHAIRMAN. Are you still doing some experiments as to the relative preservation of timber?

Mr. GRAVES. Not only in the different kinds of preservatives, but also testing the effect of these preservatives on the mechanical properties of wood, on their durability and their strength.

The CHAIRMAN. The preservative treatment of timber has passed to the commercial stage, as I presume you know, and I wondered whether it was necessary to continue the investigations.

Mr. GRAVES. I think it is exceedingly necessary, sir, to continue the investigations, not perhaps so much with regard to the preservatives themselves but how to secure the widest possible use of preservatives with different kinds of timber. For example, we want to find out what kinds of fence posts the farmer could treat to advantage, and then we want to get him actually to do it.

Mr. LAMB. Our former chairman, Mr. Wadsworth, I remember asked the question whether any of these things would ever stop, and that is the question in my mind continually.

The CHAIRMAN. My question was influenced by knowledge of a tie-treating plant in Oklahoma, maintained by one of the railroads there, where they are treating ties with a creosote preparation on a very large scale and very effectually.

Mr. GRAVES. We are cooperating with a great many different private enterprises in this class of work—railroads and lumber companies, and so on, which are interested in results. I may say that the laboratory at Madison is one of the most, if not the most, completely equipped laboratories of its sort anywhere in the world.

Mr. HANNA. Is any other preservative being used except creosote?

Mr. GRAVES. Yes, sir.

Mr. HANNA. Commercially?

Mr. GRAVES. Yes, sir.

Mr. HANNA. What are they?

Mr. GRAVES. I am sorry to say that I am not sufficiently expert to go into that question in great detail. There is the zinc chloride proc-

ess, and there are various creosote processes, with and without steam, and with pressure or vacuum, or both, and also processes with other preservatives.

The CHAIRMAN. If there are no further questions on this paragraph we will pass to the appropriation for experiments and investigation of range conditions within national forests and the methods of improving the ranges by reseeding and other means, for which you ask an apparent increase of about \$7,000.

Mr. GRAVES. Yes; \$6,600.

The CHAIRMAN. What is the necessity for that increase?

Mr. GRAVES. We want a larger force of men. We want to employ three new field men and to provide for their traveling expenses. The force is now very small, and this is a very important subject. We are studying the effect of grazing on the range and trying to find methods of improving the forage crops and utilizing it to the highest degree. We are also studying improved methods of handling the stock in order that the waste of forage may be reduced to a minimum and damage to the forest prevented.

The CHAIRMAN. Do you employ experts who devote their entire time to that work?

Mr. GRAVES. Yes, sir. These are scientific men who are sent out from the Washington office, and we are cooperating with the Bureau of Plant Industry in the methods of the scientific research.

The CHAIRMAN. Are you attempting to reseed any of these ranges?

Mr. GRAVES. We are conducting experiments in reseeding to find out the conditions under which it can be done successfully and the cost.

The CHAIRMAN. Has there been any method approved by which you can reseed a prairie grass range?

Mr. GRAVES. I am sorry I can not give you the details of the different grasses, sir.

Mr. HAWLEY. Will these men be transferred to the statutory roll?

Mr. GRAVES. No, sir. These are scientific experts.

The CHAIRMAN. The next paragraph seems to contain a good deal of new language, as follows:

Necessary for tree planting and for the reproduction of existing forests and the regulation of cutting; for the collection and purchase of seed and for expenses of reproduction.

Of course you have been doing all those things?

Mr. HAWLEY. Mr. Chairman, in the first three clauses is there not a repetition of the words below which were struck out?

Mr. GRAVES. When we prepared that statement, Mr. Chairman, we had asked for a larger increase for this item than was finally decided upon, and that really explains the reason, because we included in here the collection and purchase of seed and so on. That could probably be simplified and new language eliminated here if we introduce on page 40 of the estimates the words I suggested.

The CHAIRMAN. Does not the provision for tree planting imply the right to collect seed and purchase seed? How could you conduct an experiment looking to the reforestation of any ground without purchasing or in some way acquiring seed?

Mr. GRAVES. We could not.

The CHAIRMAN. You do not see any particular reason why the old language should not be restored, do you?

Mr. GRAVES. I think with the introduction of those few words on page 40, that would cover it.

The CHAIRMAN. Well, in the present paragraph we will have the language "for the maintenance of nurseries, collecting seed, and planting." I think if the gentlemen who make up these estimates knew how much trouble a new word caused us they would be a little careful about making changes.

Mr. GRAVES. I think I was responsible for some of that, and I did not appreciate that difficulty, I will admit.

The CHAIRMAN. How does the appropriation there compare?

Mr. GRAVES. The old item was \$66,000, and there is an increase of \$100,000, which would go toward reforestation.

The CHAIRMAN. I see. You ask practically, then, for an increase of \$100,000.

Mr. GRAVES. \$100,000, sir.

The CHAIRMAN. In order to extend your reforestation?

Mr. GRAVES. That is where it will be spent.

The CHAIRMAN. You cut out the next paragraph, do you, or do you insert it somewhere else?

Mr. GRAVES. That was incorporated in a new paragraph on the top of page 47.

The CHAIRMAN. Both those at the bottom of page 46 are combined; is that the idea?

Mr. GRAVES. Yes, sir.

The CHAIRMAN. Is there any new work involved?

Mr. GRAVES. No, sir; that is for the general expenses of administration.

The CHAIRMAN. What is the particular reason why you thought it necessary to combine those two appropriations?

Mr. GRAVES. Well, those two are closely related together, general investigations from our Washington office.

Mr. HAWLEY. Is there any new work involved?

Mr. GRAVES. No; no new lines of work.

The CHAIRMAN. Is there any increase in the appropriation?

Mr. GRAVES. No, sir.

The CHAIRMAN. There is an apparent decrease.

Mr. GRAVES. May I ask Mr. Zappone a question? Mr. Zappone, was not the idea of including that so as not to have that 10 per cent clause for general administration?

Mr. ZAPPONE. That was the principal purpose; also to reduce the number of the subappropriations. You are practically consolidating two, and you might say three, subappropriations, because the subappropriation for administration was a separate item created under the 10 per cent clause, which follows further down; and in making up your new estimates and subdividing by forests you probably will either have to restore that 10 per cent for administration or else the committee will have to fix upon some definite amount for administration.

The CHAIRMAN. Where does the item for administration appear?

Mr. GRAVES. It now appears at the top of page 47.

Mr. ZAPPONE. Here [indicating].

The CHAIRMAN. Then, as a matter of fact, this paragraph in italics at the top of page 47 is a consolidation of the last two paragraphs on page 46 and the last paragraph on page 27?

Mr. GRAVES. So far as the last paragraph of page 47 applies to administration from the Washington office; the administration of the district offices is included in the amount on page 46 under each district.

The CHAIRMAN. You see, the trouble with that is, from the committee standpoint, that it opens up the guns again against the proposition of big lump sums. Now, if you were to leave that appropriation as it was in the bill, would you divide it about as it appears in the present law?

Mr. GRAVES. I think so, although I would like to verify that at my office.

The CHAIRMAN. For the information of the committee, I would like you to do that; and when you report on the individual forests, if you will give me further information on that line we would like it.

Mr. GRAVES. Yes, sir. In dividing the appropriation by forests we would then throw the general administration of that into this 10 per cent clause, as it was last year.

The CHAIRMAN. I should think so. In a word, I believe this bill ought to be just as close to the present law as your good sense and the good Lord will let you make it.

Mr. STANLEY. I would like to ask about this paragraph on page 47, in regard to enabling the Secretary of Agriculture to test certain plants and woods.

The CHAIRMAN. Mr. Graves told us that that paragraph was consolidated with the paragraph on the preceding page, making one new paragraph which is there in italics.

The next paragraph, carrying \$490,000, provides for permanent improvements of the forests. I thought you said at the beginning of the hearing that you were asking for something like \$290,000 for that work. It seems there is \$400,000 there.

Mr. GRAVES. There is an increase in the appropriation of \$215,000 over the current year's appropriation.

The CHAIRMAN. I didn't know you had any appropriation for permanent improvements this year.

Mr. GRAVES. Two hundred and seventy-five thousand dollars.

The CHAIRMAN. Oh, yes; I see it at the bottom of this page.

Mr. STANLEY. This change in the law—the cutting out of this paragraph on page 47 and the insertion of the \$177,000 proposition on page 46—does not leave you, as I understand, any discretion about making any experiments with any part of this appropriation except for wood.

Mr. GRAVES. That is all we are doing, sir.

Mr. STANLEY. But the language of this other paragraph, I remember, when it went in the bill—the language of the paragraph was so stated at the time to allow them to use wood and other plants. You see the other appropriation was “such wood and other plants.”

Mr. HOWELL. I think that is well taken.

The CHAIRMAN. You had better make a note of that, so it can be considered later.

I presume you have nothing to add to what you have said as to the necessity for this appropriation for improvement of the forests?

Mr. GRAVES. No, sir.

The CHAIRMAN. What would you think, following the suggestion of Mr. Hawley, of the practicability of distributing this sum for the improvement of forests among your various individual forest items?

Mr. GRAVES. Personally I should very much prefer to put that off another year, until we could balance up the necessity of spending it on one forest or another. I feel that I ought to go more into the detailed plans, including some field work; we have made allotments to forests in our estimates, but it might prove desirable to spend more in one forest and less in another than we have planned, in order to get the best results with the money.

Mr. HAWLEY. And in the next bill would you be prepared to distribute them?

Mr. GRAVES. Oh, yes; we could do that perfectly well.

Mr. HAWLEY. I think it ought to be done.

The CHAIRMAN. What part of the appropriation for this year have you already expended?

Mr. GRAVES. Of the \$275,000?

The CHAIRMAN. Yes.

Mr. GRAVES. I think probably we have spent about 50 per cent of it by this time. Don't you think we have spent that much, Mr. Plummer?

Mr. PLUMMER. Fully that; yes, sir.

Mr. HAWLEY. And is the balance unexpended covered back into the Treasury at the end of the fiscal year?

Mr. PLUMMER. Yes, sir.

The CHAIRMAN. I suppose you could furnish a statement of what has been expended?

Mr. GRAVES. What amount has been expended?

The CHAIRMAN. No; of what has been done with it.

Mr. GRAVES. Oh, yes; we can do that. The construction work of the year comprised 2,225 miles of trails, 320 miles of roads, 1,888 miles of telephone lines, 65 bridges, 563 miles of fences, 181 miles of fire lines, 464 cabins and barns, and 51 corrals. This was an increase of 25 per cent over the previous year in the mileage of lines of communication and protection constructed, and a reduction in the number of buildings of 20 per cent and in miles of fences of 28 per cent. Nearly 10 per cent of the whole amount appropriated for permanent improvements went into repairing damages to existing roads, trails, and telephone lines, which suffer heavily in the winter storms.

The CHAIRMAN. The next paragraph seems to have an entirely new proviso:

Provided further, That so much of an act entitled "An act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1908," approved March 4, 1907, which provides for refunds by the Secretary of Agriculture to depositors of moneys to secure the purchase price of timber or the use of lands or resources of the national forests such sums as may be found to be in excess of the amount found actually due the United States be, and is hereby, amended hereafter to appropriate and to include so much as may be necessary to refund or pay over to the rightful claimants such sums as may be found by the Secretary of Agriculture to have been erroneously collected for the use of lands or for timber or other resources sold from lands located within, but not a part of, the national forests, all for alleged illegal acts done upon such lands, which acts were subsequently found to have been proper and legal.

At present when such a case occurs does the claimant have to put in a claim to Congress and it has to work its way to the Court of Claims and all that machinery before the money can be repaid?

Mr. GRAVES. Yes. It may happen that in grazing on what turns out to be private land—that is, where there has been an error or we

have found that the status was not correctly reported, or in some such way as that—there are sometimes payments made which we wish to refund. Most of the cases, however, arise from a permittee's not being able to use the range, for reasons beyond his control, after he has paid for it, or from his having been called on to pay more than finally proves to have been due. The solicitor was anxious to have the language such that there could be no question about the Government fulfilling its obligations in such matters.

The CHAIRMAN. Is it the understanding that the last paragraph of this page is taken care of in the present paragraph?

Mr. GRAVES. It is taken care of in the first paragraph of page 47 and in the items for the different districts on page 46.

Mr. HAWLEY. It looks to me that if that last paragraph on page 47 is cut out in its entirety, your option of transferring 10 per cent from one part of the appropriation to another is totally eliminated.

Mr. GRAVES. Yes, sir.

Mr. ZAPPONE. The 10 per cent included in the Forest Service appropriation refers to general administration only; the 10 per cent under which they may transfer from one subappropriation to another subappropriation will be found in the back part of the appropriation bill for the Department of Agriculture and refers to all bureaus in that department.

The CHAIRMAN. Well, what changes have been made either in your bookkeeping or in the language of this bill which makes it no longer necessary to provide 10 per cent for administration expense?

Mr. ZAPPONE. They have consolidated these two paragraphs and added the words "general administration," and have included a sum sufficient for that purpose for the city of Washington. The general expenses for the districts will be found in the amount set aside under the district captions. Transfers of funds must be confined to the general appropriation of each particular bureau—that is, it must be a transfer from one subappropriation to another under the appropriation for general expenses of that particular bureau.

The CHAIRMAN. Is that a continuing appropriation?

Mr. ZAPPONE. It is a continuing provision, and is to be found in the back part of the bill.

The CHAIRMAN. And therefore it does not appear in the part of the language in this bill.

Mr. ZAPPONE. Yes; it does.

The CHAIRMAN. Oh, yes; I find it. It is to be found on page 83:

And not to exceed 10 per cent of the foregoing amount for the miscellaneous expenses for the work of any bureau, division, or office herein provided for shall be available interchangeably for expenditure on the objects included within the general expenses of such bureau, division, or office; but no more than 10 per cent shall be added to any one item of appropriation except in cases of extraordinary emergency, and then only upon the written order of the Secretary of Agriculture.

I believe that concludes the Forest Service.

Mr. GRAVES. Mr. Chairman, there are some general items on page 84 which concern the Forest Service. The first item is to provide for the possibility of such a grave emergency as we had this year in fighting fire; that is, instead of undertaking to increase the regular appropriation for fighting fires, to provide for an emergency.

The CHAIRMAN. I see that. Is there anything else relating to your bureau on this page?

Mr. GRAVES. Yes, sir; the second paragraph also, the matter of the return of the 25 per cent of the receipts of the forests to the different States.

The CHAIRMAN. Has any precaution been taken up to date to ascertain whether, in point of fact, the requirements of the law were complied with by the States and Territories?

Mr. GRAVES. We have sent out such inquiries after discussing the matter with the solicitor as to our authority to do so, and it was his opinion that we might ascertain the facts.

Mr. HAWLEY. It goes further than that; it amounts to a forfeiture.

Mr. GRAVES. Yes, sir; we are authorized now only to inquire about it, I understand.

Mr. HAWLEY. Well, have you any information that any State has not used this money for the building of roads or the maintenance of schools?

Mr. GRAVES. There have been enough general statements from persons in different parts of the country that it has not been distributed within the State to make it desirable to bring the question up, and some—

Mr. HAWLEY. What do you mean by "distributed?"

Mr. GRAVES. That the State has not distributed to the different counties for the construction of roads, and so forth.

Mr. HAWLEY. Have you any specific instance in mind?

Mr. GRAVES. There has been enough local protest made to us to make inquiry seem appropriate.

Mr. HAWLEY. Do you know it to be a fact?

Mr. GRAVES. No, sir; we are inquiring about it now. So far as the information we are receiving shows, the money has been properly expended.

The CHAIRMAN. But the intention of this paragraph is that in case a State did not comply with the provisions of the law the fund shall return to the National Treasury?

Mr. GRAVES. Yes.

Mr. HAWLEY. It goes further than that, in that if in the judgment of the Secretary of Agriculture, upon information he may receive, that such has not been the case—which information might be erroneous—the State is deprived of its fund unless Congress should especially appropriate it; it seems to me that is going too far.

Mr. STANLEY. It gives the Secretary of Agriculture a broad judicial discretionary power.

Mr. HAWLEY. It could hardly be called a mere suspension. I take it from his statement, made a moment ago, that the money was being properly used.

Mr. GRAVES. We never inquired about it before.

Mr. HAWLEY. Your information now is that the money is being properly used?

Mr. GRAVES. This would let the Secretary inquire whether it has been or not, and while the answers to our inquiries have not all been received, the letters we have received so far indicate that the money is being properly used.

Mr. HAWLEY. So, on the face of the matter, the whole paragraph is unnecessary.

Mr. GRAVES. But if we found now it is not being properly expended, I suppose there would be some question as to what should be done.

The CHAIRMAN. Well, suppose we get some information that the law is not being complied with. There is not now any provision in the statute prescribing the course that shall be employed. When a criminal statute is passed, it is certainly not to be assumed that any individual man will violate it, and yet the law goes on to provide what shall be done in case he does violate it.

Mr. HAWLEY. This is not a criminal statute.

The CHAIRMAN. That is very true, and yet I should suppose there ought to be some way of ascertaining that a grant is properly used.

Mr. HAWLEY. But, Mr. Chairman, in the history of this country I think that no grant has ever been dealt with in this way unless there was information that the grant was being violated.

The CHAIRMAN. Let me give you this illustration: In the agricultural-college act it is made the duty of the Secretary of the Interior and the Secretary of Agriculture to ascertain whether the various States which receive the funds are using them as the law requires, and that they must be certified to the Treasury before they can pay a dollar. Now, under the present law, by an oversight, I take it, we provide for the payment to the State of 25 per cent of the proceeds from the forests located within those States, prescribing what shall be done with that fund, and yet giving an unconditional grant, and we do not follow it up—unless we enact this provision or something like it—with any provision to determine whether or not the money is being used for the purpose specified in the law.

Mr. HAWLEY. But from the information we have just received—the statement of the forester—it appears that the terms of the grant are being complied with.

The CHAIRMAN. But suppose subsequently information should come to us that the terms are complied with.

Mr. HAWLEY. If we had information that there was necessity for legislation, we could legislate. It seems to me it might be provided that the Secretary of Agriculture should have authority to make this investigation and report.

The CHAIRMAN. He already has authority to make it, as I understand.

Mr. GRAVES. Yes.

The CHAIRMAN. And this is simply a provision almost following the language of the Morrill Act, that the Secretary shall ascertain and certify to the Treasury prior to a certain date whether in his judgment each State and Territory is complying with the provisions of the act, and it is only when he discovers that they are not doing so—and of course no Secretary would base his action upon a mere suspicion—that the money is withheld; but we can consider that more at leisure when we come to discuss the bill in executive session.

Mr. GRAVES. Mr. Chairman, the next paragraph is the one which provides for meeting expenses on behalf of those injured in fighting fires and doing other hazardous work.

The CHAIRMAN. Has the act of May 30, 1908, been construed by anybody in authority to the effect that it does not apply to officers or employees of the Forest Service?

Mr. GRAVES. My recollection is that it specifically applies to certain branches of the Government service, and I think also that it applies to a certain class of employees in those branches—mechanics and artisans, I think—and would not cover the rangers and supervisors or others who might be fighting the fires.

The CHAIRMAN. I think that is true. I think that act refers to the employees of the Railway Mail Service and to certain mechanics.

Mr. HAWLEY. This act here gives them one year's salary, does it not?

Mr. GRAVES. My recollection is that it gives one year's salary, and there is some provision regarding hospital care and medical supplies, etc.

Mr. HAWLEY. If you were hiring men at so much per day—

Mr. GRAVES. I asked the solicitor that question, and he said this would apply as the law is drawn here to temporary employees or permanent employees.

Mr. HAWLEY. Would apply?

Mr. GRAVES. Yes.

Mr. HAWLEY. The question I had in mind was this: In case of emergency you would pay a larger amount for a few days' work than you would pay a man as a salary by the year, when most of his work was not of a hazardous character. If you had to pay \$4 or \$5 a day, as I think was paid this summer in some instances, that would make their salary about \$1,800 a year, and it would seem to me that that would be hardly fair in the operations of the law.

Mr. GRAVES. Isn't it true that there is a regular prescribed method for the examination of all claims and discretion as to the amount that would be given to each person?

The CHAIRMAN. I don't remember the act clearly enough to answer that question.

Mr. HAWLEY. But I was assuming that it gave them one year's salary, and a year's salary would be based on their daily wages if there was no other agreement entered into.

Mr. GRAVES. My recollection is that it was not mandatory that the daily salary should be paid.

The CHAIRMAN. I have it before me now. It provides that—

When any person employed by the United States as an artisan or laborer in any of its manufacturing establishments, arsenals, or navy yards, or in the construction of river and harbor or fortification work, or in hazardous employment on construction work in the reclamation of arid lands or the management and the control of the same, or in hazardous employment under the Isthmian Canal Commission, is injured in the course of such employment, such employee shall be entitled to receive for one year thereafter, unless such employee in the opinion of the Secretary of Commerce and Labor be sooner able to resume work, the same pay as if he continued to be employed, such payment to be made under such regulations as the Secretary of Commerce and Labor may prescribe.

So it does not require the payment of a year's salary regardless of the extent to which the man may be injured. Is there anything further?

Mr. GRAVES. No, sir.

The CHAIRMAN. I notice another paragraph on this page which I think we may as well consider now briefly. I have no doubt Mr. Zappone can give us the reasons for it.

Mr. ZAPPONE. Mr. Graves can answer that better than I can.

Mr. GRAVES. Mr. Chairman, we transfer employees from one part of the country to another, from one forest to another, and even from one district to another, and have been accustomed to pay the freight on their household furniture; but the authorization permitting us to do that is only for men on the miscellaneous roll, and as the forest supervisors and rangers are now on the statutory roll—and they are

just the men that we transfer—this was to legalize payment for the transfer of their personal effects.

The CHAIRMAN. Was your authorization for transfer of men from this lump-fund roll carried in a general statute?

Mr. GRAVES. I don't know where the legal authority came for that. Do you know, Mr. Zappone?

Mr. ZAPPONE. It was a regulation of the Secretary based on the general statute, which permits him to make a contract with a man to do anything under the lump-fund appropriation. The comptroller has held that if a man receives a specific salary as an employee on the statutory roll the Secretary can not increase that salary nor make any other allowances as extra compensation. When these people go over to the statutory roll, to grant authority for them to transfer household goods from one station to another would be equivalent to the giving of additional compensation, and that would be prohibited. But the comptroller has held that the fixing of salary on a lump-fund roll is purely a contract between the head of the department and the man, and the Secretary may include in the appointment paper any additional item he sees fit, such as a certain per diem in lieu of subsistence or an allowance for horse hire. The regulations regarding household goods were issued by the Secretary under his authority as set forth by the comptroller.

The CHAIRMAN. Can you give the committee any idea of the number of these transfers that are made from year to year?

Mr. GRAVES. They are growing, of course, less and less as our forest force becomes more permanent, but where we lose a ranger and there happen to be two or three good rangers on another forest we frequently transfer from one to another. I can not give you the number without looking them up.

The CHAIRMAN. Does your ranger force change a good deal every month?

Mr. GRAVES. No, sir; we are developing a fairly permanent ranger force, so far as the men employed the year around are concerned. We have some men on the rolls who are employed during a part of the year, during the open season.

Mr. LEVER. How much will it cost to put this provision in operation?

Mr. GRAVES. I could only estimate it by the amount which has been spent during the last year.

Mr. LEVER. That would be a good—

Mr. GRAVES. Showing just what we have been expending and I can only get that for you by sending out to all the districts for it.

Mr. LEVER. Have you estimated back here in your general expenses for this general provision?

Mr. GRAVES. Yes; that is provided for. It would not require any additional appropriation.

The CHAIRMAN. Have you anything further to present to the committee?

Mr. GRAVES. No, sir.

The CHAIRMAN. If not, the committee is greatly obliged to you for your attendance, and we will now stand adjourned until 10.30 o'clock to-morrow morning.

(Thereupon at 4.30 o'clock p. m. the committee adjourned until to-morrow, Tuesday, December 13, 1910, at 10.30 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Tuesday, December 13, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

There appeared before the committee Dr. Alonzo D. Melvin, Chief, and Mr. George M. Rommel, Chief of Animal Husbandry Division, Bureau of Animal Industry, Department of Agriculture.

The CHAIRMAN. We will take up for consideration this morning the estimates of the Bureau of Animal Industry, and I will ask Dr. Melvin, the chief of the bureau, to come before the committee in order to give us information in regard to any recommendations that appear in these estimates. But before proceeding to the discussion of the estimates in detail I would like to say to Dr. Melvin that if he has any general statement to make to the committee we would be glad to hear it.

**STATEMENT OF DR. ALONZO D. MELVIN, CHIEF BUREAU OF
ANIMAL INDUSTRY, DEPARTMENT OF AGRICULTURE.**

Dr. MELVIN. Mr. Chairman and gentlemen, the principal thing that has occurred in our work, outside of that which has continued for several years, was the purchase of a farm near Beltsville, Md., for which appropriation had been made of \$25,000. This farm includes about 475 acres of land, thirty-odd acres of which contain a very fine white-oak grove. We have done some improving of this farm, but not a great deal as yet, as it was not obtained finally until the 30th day of June, the last day on which our appropriation was available. This delay was caused by there being a large number of heirs, some of whom were in Alaska and other places, and it was very hard to get clear title until the last moment.

In our estimates we have included an amount of \$65,000 for the purchase of quarantine stations.

The CHAIRMAN. Before you pass from this Beltsville proposition I should like to have you give us a few more details in regard to it. I believe the current law carries an appropriation of \$13,000 for equipment, construction, etc.?

Dr. MELVIN. Twelve thousand, I think.

The CHAIRMAN. How much of that has been expended, and what have you done?

Dr. MELVIN. We have expended but a very small amount of that sum. That sum is being reserved for the erection of buildings and making permanent improvements, as are indicated in the law which carries that sum. The funds that we have been expending were provided out of the amount provided for the animal husbandry and dairying, and a good deal of the material was purchased during the last of the last fiscal year. We have been trying to get the ground that was suitable for cultivation in shape—fixing fences; putting a

large, strong, woven-wire fence around the entire outside. We had a topographical survey made by the Forest Service, which is equipped to do that work, so that we could intelligently form ideas as to proper drainage and fencing and locations for buildings and things of that sort.

The CHAIRMAN. How much of that farm is under cultivation?

Dr. MELVIN. The greater part of it is under cultivation, except where the buildings are located. I should say that probably all of it is susceptible of cultivation, with the possible exception of 75 or 100 acres, or such a matter.

The CHAIRMAN. You think there is not to exceed 100 acres out of the 400 and more that are not tillable?

Dr. MELVIN. I should think, so; not over 100 acres that is not tillable.

The CHAIRMAN. Were any crops grown on the farm this year?

Dr. MELVIN. No. The owners were expecting to sell and did not crop the place. I think one man did put in a small amount of corn, which we permitted him to gather, and there was quite a lot of timothy which we cut ourselves; but the farm was not worked to amount to much this summer. It was not possible, because the owners were expecting to sell it, and we could not, of course, do anything until we knew we owned it.

The CHAIRMAN. When did you take it over?

Dr. MELVIN. On the 30th day of June.

The CHAIRMAN. All you have done so far in the way of permanent improvements has been to build fences?

Dr. MELVIN. Build fences, and some cultivation this fall and remove the brush and clear the place of broken-down fences. I would like to say that there is a most magnificent grove of white-oak timber on the place, and I have learned since that the value of this timber would be almost sufficient to pay for the entire place.

The CHAIRMAN. Is it merchantable timber?

Dr. MELVIN. Yes, sir. There is a firm of veneering manufacturers of Baltimore which would be very glad to buy all of the white-oak timber.

The CHAIRMAN. You think there is no danger that the Forest Service will take it away from you under Executive order as a national forest?

Dr. MELVIN. They are cooperating with us and have gone through the timber and indicated certain trees that they say should properly be cut, and we expect to work with them in the handling of this grove.

The CHAIRMAN. Whom have you on the farm now?

Dr. MELVIN. We have one of the employees of the bureau, who has been in the bureau for a number of years, who is temporarily in charge there as superintendent, Dr. Wooden. He is a veterinarian in the department.

The CHAIRMAN. Does he live there?

Dr. MELVIN. No; his family does not live there. We have another man, a carpenter, who is looking after the building of fences, repairing the stables, etc., who does live in one of the houses.

The CHAIRMAN. What construction do you think will be necessary during this and next year?

Dr. MELVIN. We want to put in a water plant, and also a dairy house and dairy stable, and various stables for the use of the chief of the Animal Husbandry Division in his breeding work. The idea is to divide the farm between those two divisions of the bureau and let each use their part for their own work.

The CHAIRMAN. Have you transferred any of the stock yet from Bethesda to this place?

Dr. MELVIN. Yes; I think the zebras have been taken over there and, I think, the poultry. Mr. Rommel can tell you more in detail, if you will permit him to answer that question.

Mr. ROMMEL. All the horse stock has been transferred and the poultry stock will be transferred later.

The CHAIRMAN. I understand that it is your purpose to transfer all of the animal husbandry work, which has heretofore been done at Bethesda—the feeding and breeding and other experiments along that line—to Beltsville?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And you expect to have all the stock transferred, I presume, just as soon as the farm is prepared for them?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Have you any more detailed plans now for the work to be carried on at this place than you had when you came before the committee last year?

Dr. MELVIN. We have not worked it out in sufficient detail. We have hardly reached that stage yet. In fact, we have not determined as to the character of the buildings which should be erected. It is our intention to try and build buildings which will be practicable for farms in every respect, and which will be durable and sightly, without being too expensive. Just what type of building we will decide on has not been determined yet.

The CHAIRMAN. Have you any idea what the limit of cost will be on any one of these buildings?

Dr. MELVIN. No, sir; we have not gone into the details of that yet. Of course, material has advanced in price so much that without having a close estimate by an architect it would be almost impossible to tell with any degree of accuracy. We waited on the topographic survey and the tentative division of the farm between these two divisions of the bureau, in order to know where the different buildings could be located most advantageously.

The CHAIRMAN. Are these farms situated so that they can be thrown together, or do public roads divide them?

Dr. MELVIN. No; it is all one body—it is not divided by any public road.

The CHAIRMAN. Will you have to erect a dwelling house or an office building?

Dr. MELVIN. There are two dwelling houses, very fair houses, on the property now. One is a very very old building, probably 150 years old. The other is a newer wooden building.

The CHAIRMAN. What material is the old building?

Dr. MELVIN. That is brick. It is the remains of an old estate, as I understand it, which was there during the colonial days. But the other buildings do not amount to much. There is one small frame stable that we have enlarged somewhat by adding lean-tos for temporary use, and near the old house is an old cornercrib and an old

small stable, buildings that are in a very tumble-down condition—and we will have to practically build all new outbuildings and stables and put in a water supply.

The CHAIRMAN. Where do you expect to get your water?

Dr. MELVIN. From a well. We expect to have a deep well dug so as to run the water by pipes into the various portions of the farm.

The CHAIRMAN. Are there no wells on the place now that would supply the water necessary?

Dr. MELVIN. I do not think they are suitable. They have wells there that are supplied by two pumps, but I think that if we would put in a deep well, which would always be sure of supplying the water, it would be more satisfactory. We were figuring on getting a pump to work by electricity.

The CHAIRMAN. Do you think the average farmer could afford to pump his water by electricity?

Dr. MELVIN. I think so.

Mr. ROMMEL. Mr. Chairman, I would like to state that on the Morgan horse farm of the bureau we have such a plant. It is operated by electricity. The force that drives the water is compressed air; and an exact duplicate of that plant is used, to my knowledge, on a small dairy farm, not 50 miles from the bureau farm, that cost the farmer something in the neighborhood of \$300. He is near a trolley line, and he has an unlimited supply of water for his house, his farm buildings, and his fields.

The CHAIRMAN. You expect to get the current, then, from a near-by trolley?

Mr. ROMMEL. Yes.

The CHAIRMAN. And not manufacture it yourself?

Mr. ROMMEL. No.

Mr. HAWLEY. Do you know what that farmer pays for such a plant per year?

Mr. ROMMEL. I do not; no, sir. I imagine it is about 5 to 7 cents per kilowatt hour. Of course, if a farmer happens to have a stream on his place, he can get his electricity at very small cost.

The CHAIRMAN. What would be the difference in the cost of installing this electrical plant and a windmill?

Dr. MELVIN. The first cost, of course, would be in favor of the windmill; but it is not satisfactory. It is constantly out of repair, and frequently, when you want the water most, the wind does not blow. We have had a windmill, I may say, at Bethesda, and also steam power, and now have electric power, and electric power is the most satisfactory, and I think in the long run is the cheapest.

Mr. HAWLEY. Have you experimented with gasoline pumps?

Dr. MELVIN. I think we had a gasoline pump there also for a time, but the most satisfactory service has been with electricity.

The CHAIRMAN. What was the final first cost of this farm?

Dr. MELVIN. \$25,000.

The CHAIRMAN. Just even, to a cent?

Dr. MELVIN. Even, yes.

Mr. McLAUGHLIN. What is the object of this farm, to erect ordinary model buildings to be an example to other farmers, or a place where you can carry on your own experiments in your own particular work?

Dr. MELVIN. We will try to utilize this, as far as possible, in different directions. For instance, in the erection of buildings we will try to put up such as a farmer would want, and in their construction we will also expect to study the construction with reference to buildings which accumulate the least amount of moisture. In buildings of different construction some of the walls are constantly wet in the winter with moisture accumulating on them, and why that is and what other construction should be used to avoid this is a question that we would consider. The primary use of the farm would be for the study of the two divisions of the bureau, the Animal Husbandry Division and the Dairy Division, in their lines of work.

The CHAIRMAN. In regard to the matter of construction, is not that a question for architects, and, as a matter of fact, does not every architect of any skill at all understand all about it, and know why it is that moisture accumulates on such walls, and does not he know how to construct his buildings so that moisture will not appear?

Dr. MELVIN. Most of that work has been confined more to city buildings than to farm buildings. There has not been much scientific study of farm buildings. The matter of ventilation is one that has not been studied completely.

Mr. RUCKER. Is it customary for a farmhouse to have wet walls in winter or summer?

Dr. MELVIN. Some of the stables, not the dwelling houses themselves.

Mr. RUCKER. Is that due to the locality, or is it general, in your observation?

Dr. MELVIN. I do not think the locality has anything to do with it, if the climatic conditions are about the same.

Mr. RUCKER. I have never seen very much of it, and that is the reason I was inquiring. I have seen houses constructed in the ordinary way, but I seldom ever see any wet walls. I do not know whether I noticed it.

Mr. ROMMEL. Do you use bank barns in your locality?

Mr. RUCKER. I have seen them; yes, many a time.

Mr. ROMMEL. Do you notice moisture there?

Mr. RUCKER. I never paid any attention to it.

Mr. LEVER. Have you any publication showing the best method of installing waterworks on the farm?

Dr. MELVIN. No, sir; we have not.

Mr. LEVER. Not in the department at all?

Dr. MELVIN. I would not say positively; I do not believe that there are any.

Mr. LEVER. I received a letter this morning asking about such a publication, and I did not know where to get it.

The CHAIRMAN. How many horses have you on that place?

Dr. MELVIN. I should think there were about 8 or 10 horses and mules.

The CHAIRMAN. What line of experiments are you carrying on with them?

Dr. MELVIN. Most of them are work animals that we are not expecting to experiment with. We have some grade Percheron mares that we will probably breed and raise colts from. There is one mare that was bought for the purpose of breeding to the zebra.

That is used, I think, principally as a saddle mare around the place. I think that is the only experimental one that there is there.

The CHAIRMAN. Have you got far along enough with your plans yet to be able to tell us what additional stock you expect to put on the place during the coming year, and just what line of research you expect to follow in connection with them?

Dr. MELVIN. No, sir; I would not be able to give you a detailed statement of that.

The CHAIRMAN. What are some of the problems of animal husbandry, in a general way, that you want to investigate at that farm?

Dr. MELVIN. One of the projects that we have is the development of milch goats. We have already purchased quite a few goats that will undoubtedly, by selective breeding, develop into a strain of milch goats, which would be very useful in this country.

The CHAIRMAN. Where are those goats now?

Dr. MELVIN. They are at present at Bethesda, I think. We have not facilities for taking care of them at Beltsville yet.

The CHAIRMAN. All right, what next?

Dr. MELVIN. They have a poultry plant there that they expect to transfer to Beltsville.

The CHAIRMAN. Now, will you follow along, not waiting for me to ask questions as to any particular thing.

Dr. MELVIN. May I call on Mr. Rommel to detail that?

The CHAIRMAN. I would like to have somebody called on who can give some information.

Mr. ROMMEL. Mr. Chairman, among the lines of work we are planning to do there, in addition to the work with milch goats that Dr. Melvin has spoken of, are studies on the economic feeding of poultry and studies on the growing of sheep. Especially one I have in mind, when we are ready to do it, a study of inbreeding in sheep. We have so far attained results in the inbreeding of small mammals that lead us to believe that a great many of the theories on this subject which are held almost universally are not founded on scientific fact. I can say, briefly, that we have inbred guinea pigs as closely as it is possible to mate them, breeding full litter brother and sister in each generation, for a total of nine generations to date; that is to say, we started with unrelated stock, or practically unrelated stock—you could not say it was inbred. We have mated these guinea pigs in each generation by selecting full litter brother and sister, and we have carried that on for nine generations. In that time we have upset every theory that people claim is bound to result when you inbreed mammals. We have increased the fecundity; we are increasing the size of litters—in some cases we get six. They are not all raised, but they are all born. When we started there was an average of less than three to the litter. We have increased size at birth, we have increased the rate of growth, we have increased the number at a litter, three things that the ordinary man who is not a student of breeding claims you will ruin if you inbreed.

We do not know, and we do not claim to say, whether those results can be applied to the larger animals. The only safe proposition to make is that different animals are probably affected in different ways by inbreeding, just as different plants appear to be affected in different ways by inbreeding. We want to try it first with sheep, we want to try it with poultry, and we want to try it later on with

hogs. The reason that we want to try it particularly with sheep is that some of our best field men in the bureau claim that the wool has practically been bred off the sheep on some ranges by inbreeding. I do not hesitate to say to the committee why I think we have the results we have in inbreeding guinea pigs. There is a very great Missourian who is noted as the greatest breeder of Berkshire hogs who ever lived. He has bred his hogs in and in for 25 years. In all that time he has never used a boar that he did not breed himself. In only two instances has he used sows that he did not breed himself, and when he goes into the show ring the other people wait until he gets the blue ribbon and then take what is left. The way he has done that is, he has laid down as a cardinal principle that he will never mate two animals with common defects. That is the principle we follow with our guinea pigs. This Mr. Gentry has proven apparently that hogs are not affected by inbreeding. It is a subject that we know very little about, and it is a subject, when you stop to think of it, that is of immense importance to every breeder of live stock, because if a man follows the conventional practice, he uses a male on his females for one or two generations, and has to buy another male in the course of a year or two. If there was such a thing as using that male on his female offspring successfully that man saves the price of another male. The same proposition applies to horses, although when you get into horses the mental side is so important that you are dealing with, you might say psychology—you are dealing with the purely nervous and mental attributes—it is a difficult thing to measure those in a practical way.

The CHAIRMAN. Have any experiments been made with either cattle or horses to determine the results of inbreeding?

Mr. ROMMEL. No, sir; there have not been. The reasons are simply because the subject has never been taken up as yet by any institutions that are devoted primarily to the studies underlying the breeding of animals as related to agriculture. They have made inbreeding experiments in Germany in laboratories of the universities. They have made them in one or two laboratories in this country. I do not recall any, unless it is a case in Germany, where any investigator has carried on investigations with guinea pigs or very small mammals as far as we have. But they have never applied those things to cattle, horses, sheep, or hogs. The case I mentioned is the most noted one with hogs. You gentlemen are all probably familiar with the famous New York Mills Shorthorn sale in 1873, I think it was, where one cow sold for \$40,600. The cattle that sold at that sale at those exceedingly high prices amounted to nothing, and there have been three reasons advanced why they amounted to nothing. One was that they had tuberculosis. Another was that they had had an outbreak of foot-and-mouth disease which the owners thought they had cured. The other was that they had been inbred to such an extent that their breeding powers were ruined.

In regard to the work to be done at Beltsville with horses, I am a little in doubt as to whether we ought to undertake any horse-breeding investigations there, except as incidental to running the farm. The horses that we have are used practically, as Dr. Melvin says, for work purposes, but we intend to do what every good farmer ought to do, have as many mares as we can and breed those mares as an object lesson to farmers, and it is a problem

whether to use mares of the draft type. I am inclined to think that mares of the draft type in that section of Maryland will be the most economical in the long run to use. The same proposition applies to the study of beef cattle. The utilization of roughage on an eastern farm, the possibility of raising such cattle economically under eastern conditions, where the concentrated feeds are naturally very high in price—all very useful studies. Then we will have in the division of the farm that Dr. Melvin has mentioned a direct comparison right there on the ground—in the long run, you understand—between the economy of a dairy farm and the economy of a general live-stock farm without dairying, side by side, on the same soil.

Mr. HAWLEY. What breed of animals are you going to use in your experimentation—Percheron, Clyde, Shire, or what?

Mr. ROMMEL. Our mares are grade Percherons.

The CHAIRMAN. Some scientific breeder of animals developed what he thought was a law in relation to that—what do you call it, Mendels law?

Mr. ROMMEL. Yes, sir.

The CHAIRMAN. Can you state that law, briefly?

Mr. ROMMEL. Yes, sir; that law, briefly, is that inheritance in animals is based on what they call unit characters—that is to say, there are in every animal a certain number of unit characters that go in pairs. It is a pretty hard thing to define this as to animals, because they are pretty much at sea yet as to the application of this law to inheritance in the animals. But take, for instance, plants—one plant having a long stem and another having a short stem, of the same variety. The long and the short stems would make the pair of unit characters. When you mate two individuals, one possessing one unit character, the other possessing the other, one character acts as a “dominant,” and in the resulting progeny only that character appears. The other character is a recessive and appears when you mate the cross-breeds, namely, the hybrid animals. These unit characters are inherited in the proportion of one recessive, one dominant, and two hybrids, the hybrid breaking up in the same way as the first cross.

The CHAIRMAN. Have your breeding experiments at Bethesda tended to confirm or disprove that law?

Mr. ROMMEL. We have confirmed that law as far as it applies to the inheritance of coat color in rats. It is very interesting, and if the committee has time to hear a very brief statement of that I will give it. We mated domestic rats with what are commonly known as the hooded rat. That is a rat with a white body, black head, and black stripes down the back, said to have been domesticated in China for a couple of thousand years. They are very tame, very easily handled, have no savage disposition whatever. We mated them with ordinary rats that we caught in the barns in the neighborhood; just the common gray rat. The first cross was solid gray. There has never been a mating of this kind there that was not solid gray in the first cross, and as ugly in disposition as could be imagined. They had the solid gray color of the wild rat and the ugly disposition of the wild rat, the gray color and the ugly disposition being dominant. Then they break up all down the line, and we would get all kinds of things, and we can by the proper mating get back to the original stock, as far as color is concerned. Of course, one has to

be very careful in stating how an experiment of that kind applies to animals used for milk or meat production, especially meat production, because the color of a steer, whether he is ring-streaked or spotted, does not cut very much figure when he gets before a buyer, and we do not know yet how the characters that indicate the flesh qualities apply.

Mr. HOWELL. Did you employ male or female?

Mr. ROMMEL. Both ways.

Mr. HAWLEY. It has been stated that animals that had black hides were not looked upon with favor by the meat producers as are those that have red and white hides.

Mr. ROMMEL. There is an object lesson right there [referring to picture of Angus cattle on wall]. That load of steers brought the highest price on the Chicago market of any load of steers ever sold, \$15.50 per hundred pounds. These (Herefords) were also in great demand, as were those over there (Shorthorns), but not as high priced. As a matter of fact, the Angus cattle, shown in the picture above the chairman's seat, are the cattle preferred by the packers. They are the most valuable corn belt cattle, for the reason that they stand heavy feeding better than any others. You can cram corn into an Angus steer and he keeps smooth, but if you force a Hereford or a Shorthorn to the same extent he gets rough. The color cuts no figure. It is the conformation of the animal, where the meat is, that counts.

Mr. COCKS. How he dresses?

Mr. ROMMEL. Yes, sir; how he dresses.

Mr. LEVER. What do you regard the best beef cattle for the South?

Mr. ROMMEL. We are studying that proposition now, Mr. Lever. I can not answer that question. I can tell you in a general way what we have done with the cattle. We have used grade Angus, Shorthorn, Hereford, and Redpolls, and much to my surprise the Redpoll grades stand a winter on cotton stalks as well as any.

Mr. LEVER. I want to ask you about this theory that they are breeding the wool off of sheep.

Mr. ROMMEL. That simply is a statement that was given to me by one of the best field men we have in the Bureau of Animal Industry. I was discussing this inbreeding experiment with him, and he said, "It will not do." I said, "Why?" He said, "I have seen the fleeces completely destroyed in the West by inbreeding; they would get open, coarse, and thin in wool."

Mr. LEVER. It affects the amount of wool produced?

Mr. ROMMEL. The amount, and its quality, and all that, and the character of the fleece.

Mr. STANLEY. They have carried these experiments to a greater extent, to a more startling extent, in Paris than anywhere else, have they not?

Mr. ROMMEL. I believe there was something done in France. The inbreeding work I particularly referred to was done in Germany.

The CHAIRMAN. Dr. Melvin, will you proceed?

Dr. MELVIN. The item of \$65,000 was for the purchase of quarantine stations.

The CHAIRMAN. Pardon me. I think if you have nothing further in the way of general statement concerning the work of your bureau during the past year we will take up the estimates in their order and

discuss that one when we come to it. You have nothing further, then, Dr. Melvin?

Dr. MELVIN. No; I have nothing especial.

The CHAIRMAN. Taking up the estimates on page 11, I find that you have asked for an increase of \$500 in the salary of your chief clerk and an increase of \$250 in the salary of your editor and compiler. How long has the position of chief clerk been held by the same man?

Dr. MELVIN. This man has had the position, I should say, about three years; between two and three years.

The CHAIRMAN. And his salary has been \$2,000 during all that time?

Dr. MELVIN. Yes, sir; \$2,000 has been the salary for that position for a number of years. There has been no increase made in the pay for probably 15 years.

The CHAIRMAN. Do you know how long he has been in the bureau?

Dr. MELVIN. He has been in the bureau in different positions for about 13 or 14 years.

The CHAIRMAN. You ask for an increase of \$250 for your editor and compiler. How long has that salary been \$2,000?

Dr. MELVIN. That has been the salary which he has drawn, I think, for six or seven years. I do not think there has been any increase in that salary.

The CHAIRMAN. And the same person has held the place for six or seven years?

Dr. MELVIN. No; this man has held the place for about four years.

The CHAIRMAN. Have you any particular reason to give why these increases should be made?

Dr. MELVIN. Yes; I think, in the first place, both men are exceedingly competent for the positions they are filling, and that their duties have materially increased, and it would seem that in the nature of things it would only be equitable that these salaries be increased to that amount and in proportion to salaries of similar positions in other bureaus of the department.

The CHAIRMAN. In what way and for what reason have their duties increased?

Dr. MELVIN. The work of the bureau itself has increased very materially from year to year, and of course their duties have increased therewith.

The CHAIRMAN. Do they work longer hours than they formerly did?

Dr. MELVIN. Yes, they both do; they both work a great deal overtime. In the case of our chief clerk he is frequently there till 6 o'clock, and often has work to take home with him. Both of them take home work every week and work at it at night in order to complete their duties.

The CHAIRMAN. It would be impossible for them to get through with the work which they individually have to do within the time?

Dr. MELVIN. There is such a multitude of interruptions during the day, to take up a piece of work which requires considerable thought they have to take it home to do it. We all have to do more or less of that, all of us.

The CHAIRMAN. It is work which they have to do personally; it is not work which could be given to a subordinate?

Dr. MELVIN. No, sir; it is work which they have to do themselves.

The CHAIRMAN. In the last item on that page it appears that an increase of five clerks is submitted, three by transfer from lump funds, and two new places. I suppose your reasons for that would be simply the increase of the work of your bureau?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. In the next paragraph, providing for 20 clerks, an increase of 2 is again submitted, and I presume the same reason would apply there?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. And all the way through, wherever you have asked for an increase of clerks, you have done it after careful consideration, and because you think the additional force is absolutely needed to take care of the increased work?

Dr. MELVIN. Yes, sir; exactly.

The CHAIRMAN. In case the working time of the clerks should be increased a half hour a day, about which we have seen a good deal in the papers recently, would it make any difference in your estimate for additional help?

Mr. MELVIN. I would not like to say whether it would or would not, Mr. Chairman. Of course, an addition of time would undoubtedly enable each clerk to do a little more, but we often have to increase the number, the units, as well as the total amount of work which the clerks would do. For instance, we have some particular lines of work, some new work, that requires an additional man, and other clerks could not do that in addition to the work which they are already doing, and those are factors which I would not like to speak of definitely without making a more particular inquiry.

The CHAIRMAN. What system do you follow to make certain that your clerks are doing the work that they are able to do and ought to do? What is your efficiency system, in other words?

Dr. MELVIN. We depend on the one under whom they are immediately working to report on their efficiency. There is a system of efficiency reports which are required twice a year. These are made out by the immediate superior. Then their efficiency report in turn is made out by the one immediately above them. In the case of my immediate subordinates, their efficiency ratings would be made out by me, and then in turn they would make out the efficiency ratings of those directly under them, and these efficiency ratings are filed with each man's jacket each year, and are scrutinized and are gone over and are on file for reference as to the efficiency of the individual person.

The CHAIRMAN. Is every clerk required to make a certain grading in efficiency?

Dr. MELVIN. I do not know whether that is absolute or not. It is usual, though, where they fall in their efficiency so that it is markedly deficient, to reduce them or dismiss them.

The CHAIRMAN. Do you remember whether any clerks have been either reduced or dismissed from your bureau during the past year for deficiency?

Dr. MELVIN. Yes; there have been quite a few; that is, I will not confine it all to clerks, but different employees.

The CHAIRMAN. You do really drop people, then, when they do not come up to the standard?

Dr. MELVIN. We have to; yes, sir. Of course it is a harder thing to do under those conditions than it is where there is some flagrant violation for which you can immediately dismiss a person without much further consideration. But we are constantly letting men out of the service because of their inefficiency.

The CHAIRMAN. Would you be able to give the percentage of your force that is dropped from year to year due to inefficiency?

Dr. MELVIN. I would not like to give the percentage from memory, but the actual number dismissed for inefficiency and misconduct during the fiscal year ended June 30, 1910, was 119.

The CHAIRMAN. Suppose a law was passed absolutely requiring you to drop 10 per cent of your force every year, naturally providing that those lowest in efficiency should be in this class, do you think it would improve the efficiency of your force generally?

Dr. MELVIN. It is quite a new idea that I have not thought of before. It would have quite a stimulating effect on a good many.

Mr. HAWLEY. When you speak of reducing them, do you mean reducing them in salary or reducing them in rank?

Dr. MELVIN. Of course, with the clerks it would practically apply to the salary. I do not think we have reduced them in rank in any place, but in salary.

Mr. HAWLEY. Would putting these people on the statutory roll interfere with reductions in their salaries?

Dr. MELVIN. It might, to some extent. Of course, we could only reduce as we had positions vacant at lower salaries.

The CHAIRMAN. Turning to the note of comment upon the statutory roll on the top of page 15, I notice that 330 employees, whose salaries aggregate \$300,000, were transferred from the permanent appropriation for meat inspection, while that appropriation has not been reduced. That is just another way of asking for an increase in your permanent appropriation for meat inspection, is it not?

Dr. MELVIN. I think that the reason this was taken up in that way was on account of an act which provided for doing away with all lump-sum salaries and providing statutory positions.

The CHAIRMAN. If that were the only reason for transferring them then you should ask that your permanent appropriation be reduced, or else you will have a surplus of some \$300,000 to turn back into the Treasury. The question I am trying to get at is whether you are of the opinion that an increase of \$300,000 in your permanent appropriation for enforcing the meat-inspection act is absolutely needed?

Dr. MELVIN. I think we should have in some form or another an increase in that appropriation so as to permit of increases in salaries in that line of work and increase in the work. New abattoirs are being built, which means more expense.

The CHAIRMAN. Do you mean to say that your only reason for asking for a permanent increase in that appropriation is in order that you may increase the salaries of the men who are employed? Is that what I understood you to say?

Dr. MELVIN. No, sir. This change was made primarily under an act which required the placing of all lump-sum positions and transferring them into statutory positions.

The CHAIRMAN. I understand that.

Dr. MELVIN. That, of course, would take out certain employees. For instance, those engaged in scientific work could remain on lump-

sum funds. Those of lesser grades, like clerks and laborers and the like of that, were to be placed in statutory positions. Those classes who worked under the meat-inspection fund—the veterinarians and the meat inspectors—were classified as scientific workers, and inspectors' assistants or taggers were to go into statutory positions, and in working this out this is the proportion that was decided should go on the statutory positions.

The CHAIRMAN. Are any of the men who are transferred to the statutory roll from your meat-inspection force employed outside of Washington?

Dr. MELVIN. Yes, sir; nearly all are employed outside of Washington. Our force in Washington in meat inspection—that is, in the abattoirs—is considered the same as being outside. Only the force in our department buildings proper is considered as within Washington.

The CHAIRMAN. In what way did you classify your taggers and other employees of that class whom you say were transferred to the statutory roll? Did you classify them as laborers or clerks?

Dr. MELVIN. No; they went under their designation as unskilled laborers, I presume.

The CHAIRMAN. I find here on page 12 four inspectors' assistants, in one item, \$1,000 each, and 12 inspectors' assistants at \$840 each. Are those all that were transferred?

Dr. MELVIN. No; those, I think, are employed in work outside of meat inspection. For instance, in stock yards on contagious diseases of animals. They would be under the appropriation for inspection and quarantine, and not under the meat-inspection fund.

The CHAIRMAN. I would like to ask Mr. Zappone what his understanding is in regard to that.

Mr. ZAPPONE. Mr. Chairman, believing that the committee might wish to discuss this item very closely, I thought it wise to keep all the meat-inspection transfers together. If you will look at the center of page 13, you will find a note under which appear the places transferred from the meat-inspection roll; the preceding pages cover the transfers from "general expenses."

The CHAIRMAN. On page 13 the note you refer to states:

The following employees have been transferred from the lump-fund appropriation, "Meat inspection, Bureau of Animal Industry," but that appropriation has not been reduced, as it is a permanent appropriation. The amount of the transfers is \$300,000.

Are the places which follow that note in Washington or out of Washington?

Mr. ZAPPONE. They are both in Washington and out of Washington. Most of the strictly clerical places are in Washington.

The CHAIRMAN. Is it customary to carry places on statutory rolls which are out of Washington?

Mr. ZAPPONE. Not as a rule, but there is no law against it, Mr. Chairman. If you will read that provision of law (regarding transfers to statutory rolls) which was put into our bill last year by the Senate, you will see that it makes no reference to appropriations, nor does it make any reference to the city of Washington. It provides that all places of the classes enumerated shall be transferred to the specific statutory rolls, and this we interpreted to mean places both in and out of the city of Washington, as the action was really taken on account

of the large lump funds of the Forest Service. the bulk of their employees being in the field.

The CHAIRMAN. The provision to which Mr. Zappone refers is as follows:

The Secretary of Agriculture, for the year 1912, and annually thereafter, shall transmit to the Secretary of the Treasury for submission to Congress in the Book of Estimates detailed estimates for all executive officers, clerks, and employees below the grade of clerks, indicating a salary or compensation for each necessary to be employed for the various bureaus, offices, and divisions of the Department of Agriculture.

That is very broad, and I think the Secretary is right in construing it as applying to all employees, no matter whether their work is done in Washington or outside of Washington.

Mr. ZAPPONE. I consulted the Solicitor of the department, and that is his opinion also.

The CHAIRMAN. That appropriation has been fully complied with touching the meat-inspection service, has it, Doctor?

Dr. MELVIN. As far as we could. It appears that even with this amount there are still some under that lump fund.

The CHAIRMAN. You have all together on this roll, as I figure it out, by way of transfer from the meat-inspection service, 165 inspectors' assistants, some of them at salaries of \$840, others at \$900, and others at \$1,000. Are those all the inspectors' assistants who are employed in your service?

Dr. MELVIN. No, sir.

The CHAIRMAN. Why did you not transfer all of them, or if you did not transfer all of them, why did you transfer any of them?

Dr. MELVIN. The change, Mr. Chairman, was during my absence from the city, and I am unable to answer that question. Possibly Mr. Zappone can, if you will permit him to do that.

Mr. ZAPPONE. The original recommendation from the Bureau of Animal Industry, I think, contemplated the transfer of all inspectors' assistants, and the estimates were so prepared originally and sent to the Treasury. You have all read in the papers of how the President cut the estimates to the bone. This was one of the estimates he cut. The amount of \$300,000 was fixed upon by the President as the total increase, and the Secretary reduced the original estimates accordingly.

Dr. MELVIN. There were originally, instead of 32 inspectors' assistants at \$1,000, 37; and 6 at \$900 instead of 1; and 336 at \$840 instead of 133. This rearrangement makes the total number 330 and the amount exactly \$300,000. The original amount was about \$480,020.

The CHAIRMAN. Then, as I understand it, if the provision of the current law, which I have just read, should be fully complied with, it would involve a reduction from the permanent appropriation of \$3,000,000 of nearly half a million, and it was decided by the Secretary and the President, or whoever finally submitted the estimates, that to transfer all these clerks would either involve too great an increase in the appropriation or render necessary a reduction of the permanent appropriation, and to avoid either of those alternatives they sent in the estimate which we have before us now. Is not that your understanding?

Dr. MELVIN. I believe that is correct; yes, sir.

The CHAIRMAN. In what way would you think it necessary or wise to use the additional \$300,000 which the transfer of these people to the statutory roll will place at your disposal?

Dr. MELVIN. I think that that would permit us to make some increases in the salaries of those who remain under the three-million amount which we have not been able to do up to the present time. But it would not enable us to promote any of those who go outside. They would go under fixed salaries and have to remain there until this committee provided funds for them.

The CHAIRMAN. I was leading up to that by this question: What salaries would you expect to increase?

Dr. MELVIN. I should like to increase all along the line those who are competent and merit promotion.

The CHAIRMAN. Would you make it an individual matter, or would you fix the salary of inspectors' assistants, for instance, at \$900 instead of at \$840, to begin with?

Dr. MELVIN. I would require the men to be promoted only upon merit; that is, according to these efficiency reports which I have explained, and also by promotion examination, and I think I would fix a definite number who could be promoted. For instance, in the veterinary inspectors we have three classes, eighteen, sixteen and fourteen, and I think it would be wise to limit the number of these different classes; for instance, a third in each, so that you would not eventually have all at the higher salary. The most efficient could be promoted as vacancies occurred in the higher positions. In the case of meat inspectors I would adopt something similar. Their salaries I would suggest being at twelve and a thousand. They are now all at a thousand except some who are doing special work, who get some higher pay.

The CHAIRMAN. That whole matter has been entirely within the discretion of the Secretary or yourself, has it not, up to this time?

Dr. MELVIN. So far as our funds would permit, but we have not been able to continue that or follow it out on account of our limited funds. We had last year only about \$60,000 out of the three million left, and with the large amount of work which we have, and the indefiniteness of just what the final result will be, we have to keep considerable margin so as to prevent going to jail.

The CHAIRMAN. In making these transfers, did you have in mind, or did you make a memorandum, of the individuals who would be transferred?

Dr. MELVIN. No, sir; not individuals; only by classes.

The CHAIRMAN. Then how does it happen that you have 133 inspectors' assistants at \$840, and one inspectors' assistant at \$900?

Dr. MELVIN. I suppose they were trying to figure it out to come even \$300,000.

The CHAIRMAN. And 32 inspectors' assistants at \$1,000. Do you have three classes of salaries for inspectors' assistants?

Dr. MELVIN. Yes; there are three classes there and those few that occupy the higher positions are on account of doing a higher class of work than the bulk of them. For instance, some of them act as foremen.

The CHAIRMAN. Yes; but they all start in at \$840?

Dr. MELVIN. Eight hundred and forty dollars; yes, sir.

The CHAIRMAN. And it is a matter of promotion to reach the additional salary?

Dr. MELVIN. Then it is planned that eventually these inspectors' assistants, by examination, may be able to pass into the position of meat inspectors, and there go on still further to the \$1,200 position.

Mr. McDERMOTT. Do you not think the class of men you are getting now are not to be compared with the men you first got when you started this bureau?

Dr. MELVIN. They are much higher.

Mr. McDERMOTT. Do you have the meat inspectors there, the ex-butchers who took the examination?

Dr. MELVIN. Yes; I think we are getting better men now than we did before.

Mr. McDERMOTT. Out home in the yards I hear many complaints of men, men who are drawing \$840 a year, that they can not live on \$70 a month on account of the high prices, the increased cost of living, and they are resigning daily. Those men who are meat inspectors are resigning to go back into the packing houses at higher salaries. I know that to be a fact, because I was home all summer.

Dr. MELVIN. That is true.

Mr. McDERMOTT. And I thought you could take these 640 meat inspectors and start them at \$900, and that means \$1,160, and, as you say, get the regular meat inspectors up to \$1,200. That would be satisfactory all along the line.

Dr. MELVIN. These are inspectors' assistants. They are not qualified in meat inspection work when they enter the bureau. They are assistants, and take the place of an old class that we used to have that we called "taggers."

Mr. McDERMOTT. Then you do now believe that the meat inspectors themselves ought to go up to \$1,200 under the conditions now?

Dr. MELVIN. Yes, I believe they should under proper supervision and control, where they apparently merit it.

The CHAIRMAN. Are there any demands for inspection from establishments which are entitled to it which you have not been able to meet?

Dr. MELVIN. No, sir; not yet. We have not met that condition. The work, however, is constantly increasing.

The CHAIRMAN. This increase in your lump fund, then, brought about by the transfers to the statutory roll, would be used wholly in the way of promotions?

Dr. MELVIN. Principally, I think.

Mr. HAWLEY. How many men would be affected by it? How many men would there be that this \$300,000 would be divided up among in making promotions?

Dr. MELVIN. About 700; between 700 and 800.

The CHAIRMAN. Have you taken into consideration the question of promotions in making the transfers?

Dr. MELVIN. It would be more than that, Mr. Hawley; it would be about 1,700.

Mr. HAWLEY. One thousand seven hundred?

Dr. MELVIN. Yes, sir. I beg your pardon, Mr. Chairman.

The CHAIRMAN. I was trying to find out whether you had anticipated the promotion in salary when you transferred these places to the statutory roll, or are they carried over at the same salary the men are now getting?

Dr. MELVIN. They were carried over at the same salary they are now getting, and those that are carried over will remain at these same salaries unless some provision is made for them.

The CHAIRMAN. So that whatever promotions you might be able to make on account of this additional fund would benefit only the men who would not go on the statutory roll?

Dr. MELVIN. Exactly.

The CHAIRMAN. Then how will you determine who goes on the statutory roll? Will that be a matter of efficiency?

Dr. MELVIN. That would be a matter to be determined later, but would probably be guided by the efficiency of the ones who go on that roll.

The CHAIRMAN. Under the law, as long as you have part of these inspectors' assistants—I will use them as a class for illustration—on a statutory roll and part of them under a lump fund, would you be allowed to shift them back and forth as you wished?

Dr. MELVIN. I do not think there would be any restriction on that. If you will pardon me, though, I would personally much prefer, and I think it would be a much better working basis, if that fund could be made an exception to the general appropriation in the present appropriation bill and increased sufficiently to carry out proper increases in salaries. I think it would be more workable because I do not think it is going to be satisfactory having part of them in one form and a part in another. It will breed discontent among the men themselves, and that is one of the most important things to avoid, if possible, because the whole thing depends on the efficiency of the men.

The CHAIRMAN. If the arrangement recommended here is carried out in a general way, would you recommend increasing the salary of the lowest grade from \$840 to \$900, or some other fund; or do you consider \$840 a satisfactory salary for the first class?

Dr. MELVIN. I think that is high enough for an entrance salary for that class of men.

The CHAIRMAN. You have no difficulty in filling the places?

Dr. MELVIN. Not at all. That is a fair entrance salary for that class of men to-day, but the trouble is in being obliged to keep them there indefinitely at that pay. I think in the course of three years, say, if a man proves himself satisfactory, there should be some way for advancing him in pay, and the same with these meat inspectors. Good men, first-class meat inspectors, are willing to come to us at \$1,000 a year with a prospect of advancement, but it is when they are required to remain at that pay that they become discontented, because packers will pay from \$1,200 to \$1,500 for that same class of men. Men will leave positions \$300 or \$400 higher in pay with packers in order to work for the Government. They do appreciate a Government position, and are willing to sacrifice in order to have it, but they do not want the sacrifice to be too heavy.

Mr. McDERMOTT. And they see these veterinarians being increased \$100 and \$200 a year at times, and they can not go further.

Dr. MELVIN. We have been required to confine this promotion to all classes. We have veterinarians now who entered the service at \$1,400, expecting an increase at the end of between two and three years, who have now been in the service four or five years without an

increase; others who got their increase to \$1,600, and have long since been due for an increase to \$1,800 who can not get it, and I am afraid if we can not take care of these people we are not going to get the efficient service we have had and that we have a right to expect.

The CHAIRMAN. Your range of salaries is from \$840 for an inspector's assistant to what sum for the highest paid man who is used in the packing house?

Dr. MELVIN. Excepting those in charge of the work, \$1,800 is the usual charge. We have men in charge of work, one man at \$3,500, the man in charge at Chicago, who is the highest paid man outside of Washington.

Mr. McDERMOTT. Who is that, Dr. Bennett?

Dr. MELVIN. Dr. Bennett.

Mr. McDERMOTT. He is worth it.

Dr. MELVIN. Then generally our men in charge at small stations, some of them only get the same as the maximum salary, \$1,800. The bulk of them, however, who are in charge, at these smaller stations, get \$2,000. The man at Omaha and Kansas City, I think, get somewhere about \$2,500 to \$2,750. But for the men on the floor, the men who make the actual inspections on the killing floor, the veterinarians, they go from \$1,400 to \$1,800. There are three classes, 14, 16, and 18. My idea would be if we could have those divided into three groups and have a third in each group, so that we would not overflow into the highest, eventually it would be very satisfactory.

The CHAIRMAN. Coming below your \$1,400 class, how do the salaries run downward?

Dr. MELVIN. We have meat inspectors with a minimum salary of \$1,000, and some of those men who are in charge of stations receive higher pay. For instance, there may be a distributing house of one of the large packers at one city, like Austin, Tex., to which they ship meats and there boil hams, and do some minor work of that sort. One of these meat inspectors is placed in charge of that house, and there is no other expert in that city. Usually we pay such a man \$1,200. Then we have some of these men who are experts whom we can rely on that we use to send around where there are differences of opinion between our own inspectors and between the inspectors and the packers. There are two or three of those men who are getting \$1,400. Then we have some who are working in a supervisory capacity in the large stations, like Chicago and Kansas City, who get \$1,200. But those are the exceptions.

Mr. McDERMOTT. How do you except them? How do you make that exception?

Dr. MELVIN. By their qualifications, as indicated by the inspectors in charge.

Mr. McDERMOTT. I thought the maximum was \$1,000, and that was the reason I was asking.

Dr. MELVIN. No; the minimum is \$1,000. There is no maximum fixed.

Mr. McDERMOTT. For meat inspectors?

Dr. MELVIN. No.

Mr. McDERMOTT. Then you could increase them to \$1,200 if you had the money?

Dr. MELVIN. If we had the money; yes, sir.

Mr. McDERMOTT. You have 895 of them, have you not, at \$1,000, 4 at \$1,400, 36 at \$1,200, 895 at \$1,000, on page 20?

Dr. MELVIN. That is the bulk of them.

Mr. McDERMOTT. That only costs you \$100,000 to increase them \$100 a year. You would not have to bring them all up, only those who had been in the service three years or more, and Dr. Melvin says that the minimum is \$1,000, but that there is no maximum to what they can pay them, and they are all good inspectors, all practical butchers, and took this examination two or three years ago when this bureau started. Those men are leaving and going back to the packing houses because they do not see any advancement over \$1,000; and there has been some dissatisfaction on account of the veterinarians getting \$1,400, \$1,600, and \$1,800, and you can hear a kind of rumbling. I was home all summer, and I talked to a whole lot of the boys, and they are, of course, in favor of getting a little increase. They have been in the service four years.

Dr. MELVIN. It would cost about \$250,000 to adjust this whole pay roll on the basis I speak of and have a working fund for additional inspection.

Mr. LEVER. And your plan would be to increase the permanent appropriation \$250,000 and leave you the leeway you now have?

Dr. MELVIN. I would prefer that; yes, sir.

The CHAIRMAN. Can you tell me how many men you have who will still remain under the lump fund, even if these transfers should be made, who should be transferred under the strict construction of the current law?

Dr. MELVIN. Not definitely. There are 330 that would be transferred, and I think there are something like 1,900 under the meat inspection, total, and that difference would be left.

The CHAIRMAN. So that there would be something like 1,600 men still left to be paid from the lump fund who, as a matter of fact, under the strict construction of the provision we have been discussing, should be transferred to the statutory roll?

Dr. MELVIN. No; not that many. The veterinarians and the meat inspectors, under the terms of that provision of law, could be left under the lump fund.

The CHAIRMAN. I was only asking for the number of those who should be transferred to the statutory roll, according to your classification.

Dr. MELVIN. Two hundred and thirteen.

The CHAIRMAN. So that you are really transferring a little more than half? You are transferring 330 and there remain 123?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Passing from that item, we come to consider the general paragraphs on page 15, and I would like to call your attention to the provision for inspection and quarantine work, in which appear the words "construction and alteration of buildings at quarantine stations." Could you give the committee any idea of the amount which you would probably want to use for construction under that paragraph?

Dr. MELVIN. That is, under "General expenses"?

The CHAIRMAN. Yes; that is for your inspection and quarantine work. Or perhaps I might state the question differently, and ask you if you can give us the items which go to make up the total sum

of \$592,700; that seems to be a decrease from the present appropriation, although the change is probably due to transfer to the statutory roll.

Dr. MELVIN. Yes, it is, entirely. The amount required is the same as it was last year.

The CHAIRMAN. Have you itemized it in any way? Can you give us an idea, for example, how much you will spend for the eradication of scabies in sheep and cattle; how much for the inspection of southern cattle; how much for the supervision of the transportation of live stock and the inspection of vessels; how much for the execution of the 28-hour law, and the inspection and quarantine of imported animals, and so forth?

Dr. MELVIN. I have not brought that information with me in detail. That service, though, will remain practically as it has been for the last couple of years or so.

The CHAIRMAN. Have you any means of knowing just how much of this fund was spent in the construction of buildings during the last year?

Dr. MELVIN. Yes, we can tell that.

The CHAIRMAN. I wish, when you come to revise your statement, you would answer that question.

Dr. MELVIN. Yes, sir. There will really be very little construction of buildings. It is only to have the authority to do that in case it is necessary.

There were no buildings erected at the quarantine stations at Littleton, Mass., or Athenia, N. J., payable from the 1910 appropriations. The last buildings erected were at Athenia, N. J., three attendants' houses at \$325 each, \$975, payable from the 1909 appropriation for "Inspection and quarantine."

The CHAIRMAN. What we would like, I think, would be to make a separate paragraph of your construction, and I am not so sure but what if you can itemize this paragraph so as to set out separately the amount of money that you want for the eradication of scabies in sheep in one paragraph, and the amount you want for the inspection of southern cattle, and so on right down there, itemizing by subject, I am inclined to think the committee would like to have an opportunity to consider that kind of statement anyway. It would make it very much easier if we could split up some of these big lump funds.

Dr. MELVIN. It is a great deal harder, though, in administration, because you are then confined to that definite amount for each one. Of course we have one provision, the 10 per cent provision.

The CHAIRMAN. You have a provision of 10 per cent, and you must in your project sheet carry approximately that same thing.

Dr. MELVIN. Yes; we have that; we can furnish it.

The CHAIRMAN. So that it would not make any particular difference in your bookkeeping. It would be only a matter of leeway, and you have been carrying this work so long under the same wording that I think your experience during the past half dozen years would be a pretty accurate guide.

Dr. MELVIN. It is.

The CHAIRMAN. And I wish you would do that.

Mr. LAMB. You want it more for information.

The CHAIRMAN. I want it for information anyway.

(The statement is as follows:)

Appropriation, "Inspection and quarantine, 1910."

Inspection Division:	
Supervision and transportation of animals.....	\$9,412.03
Investigating violations of 28-hour law.....	3,711.26
Sheep scabies.....	266,746.45
Cattle scabies.....	172,787.50
Horse glanders.....	1,431.61
Southern cattle.....	18,871.52
Lip and leg disease.....	43,241.51
Administration, Inspection Division.....	6,234.08
	<hr/> \$522,435.96
Quarantine Division:	
Quarantine stations.....	9,876.29
Canadian inspection.....	22,203.52
Special investigations.....	1,743.20
Cooperative tuberculosis investigations.....	29,318.59
General tuberculin and mallein testing.....	1,634.82
Hawaiian and Porto Rican inspection.....	1,574.73
Mexican inspection.....	8,099.98
Administration, Quarantine Division.....	4,158.95
	<hr/> 78,610.08
Total.....	601,046.04
Outstanding.....	1,153.63
	<hr/>
Grand total.....	602,199.67
	<hr/>
Appropriation.....	625,000.00
Expenditure.....	602,199.67
	<hr/>
Unused balance.....	22,800.33

Dr. MELVIN. Mr. Chairman, before you leave this page 15, may I refer to that item of \$65,000 for quarantine stations? Since last year the station that we have been running at Boston is liable to be sold, some of the heirs having died, and it is probable that that property will be sold and that we will lose the use of it unless we acquire it by purchase, and that is included in the \$65,000, with the one we prepared a separate statement on for Baltimore last year.

Mr. HAWLEY. Have you options on either of those places?

Dr. MELVIN. Not definite. I think we have nothing that would hold in law, but we have prices that have been submitted.

Mr. HAWLEY. Will they raise the price at either of the stations on you if the appropriation is made?

Dr. MELVIN. I do not think so.

The CHAIRMAN. As it is worded it is not a definite appropriation for the purchase of the land, you will observe.

Dr. MELVIN. No; we have to build stables and fences.

The CHAIRMAN. The same paragraph includes a provision for the erection of necessary buildings, fences, etc., so that the passage of this law would not be notice to anybody that \$65,000 was available for the purchase of land alone, and that would be a saving clause, I take it.

Mr. RUCKER. Doctor, have you any idea how much you would have to pay for the land?

Dr. MELVIN. This land at Baltimore is on the water front and is available for dockage purposes. That is why it is more expensive. That is about 17 acres of land.

Mr. RUCKER. In round numbers, what would you say it is worth?

Dr. MELVIN. I think between \$12,000 and \$15,000. There is nothing on the property. We would have to build stables and fence it.

Mr. RUCKER. Is the land worth \$15,000?

Dr. MELVIN. Yes, sir.

Mr. HAWLEY. How much water front is there on the land?

Dr. MELVIN. Not a great deal. It is only a 17-acre tract, and it is wedge shape, the small end of the wedge coming down to the water front, plenty wide enough for any purpose we want. The rest goes back to a railroad, where we could put in a switch for removing the live stock when the quarantine was over.

The CHAIRMAN. That is the same land you were talking about last year?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Do you know whether it is held at any higher price now?

Dr. MELVIN. No; it is still available, I believe, at that same price.

Mr. HAWLEY. Seventeen acres is sufficiently large to accommodate all your work?

Dr. MELVIN. I think for that port; yes, sir.

The CHAIRMAN. You have not any quarantine station now at Baltimore?

Dr. MELVIN. Not now. Our quarantine station before was at Halethorpe, about 10 miles this side of Baltimore, but that was unsatisfactory. The ideal station—and I would call this such—should be on the water front, so that we could unload direct from the vessel into the quarantine station without passing over any highways.

The CHAIRMAN. Could you buy the station at Boston?

Dr. MELVIN. That is the property we expect to purchase.

The CHAIRMAN. How much land is there there?

Dr. MELVIN. That is considerably more; I think it is 35 acres altogether, but the improvements are poor. The buildings were built probably 30 years ago; they are all wood, and they are badly rotted and would need quite a little repairing for the buildings and fences. Some of the buildings we could use by putting in new sills.

The CHAIRMAN. What do you think you would have to pay for that property?

Dr. MELVIN. I think it was about \$6,500.

The CHAIRMAN. For 35 acres?

Dr. MELVIN. Yes, sir. That property lies thirty-odd miles from Boston, at Littleton, Mass., and has not the value that this Baltimore property has on account of its commercial value.

The CHAIRMAN. I suppose it is wholly out of the question to get any water-front property around Boston?

Dr. MELVIN. We have canvassed the situation there pretty thoroughly for several years and have not been able to find anything. In fact, this Baltimore proposition is the most satisfactory and about the only one we have been able to find. We have tried to get property from the War Department along the water fronts, but have been unable to do so.

Mr. RUCKER. As far as I am concerned, Mr. Chairman, I think we ought to have a definite statement of an offer of a price from the owners of the property before we make an appropriation at all,

because the tendency would be to spring it as soon as Congress authorized them to buy, and the result will be that there will be nothing left for improvements.

Dr. MELVIN. It would be very hard, I think, in the case of this Baltimore property, to get that, because the case is an estate that is handled by the courts, and I doubt if we could get it.

Mr. RUCKER. The Baltimore property is not so expensive as the other, is it?

Dr. MELVIN. It is the more expensive of the two. I do not think there is any doubt that we would get both of the properties for the prices they have given us. Of course we do not have to buy if they do raise the price.

Mr. RUCKER. Would you have to have another appropriation next year for the buildings?

Dr. MELVIN. No, sir. This includes the whole business—the buildings, fencing, and everything.

Mr. RUCKER. I am very much inclined to think that you would pay too much for this ground over here in Maryland. Some gentleman here the other day seemed to be conversant with Maryland—some gentleman from the department—and he spoke of land you could buy over there for \$10 an acre.

Dr. MELVIN. The owner of this property in Maryland had an opportunity to sell it before the deal was completed for several thousand dollars more than we paid for it. Furthermore, an estimate by the timber man for this white oak grove was to the effect that it was enough to pay for the whole business—that thirty-odd acres of white oak timber was sufficient to pay for the whole piece itself. The United States could dispose of it to-day at a profit of probably \$20,000 or \$25,000 if they wanted to do it.

The CHAIRMAN. That seems to be a pretty complete answer.

Mr. RUCKER. The only trouble about it is we have not sold it.

Dr. MELVIN. I hope there is no desire to sell it.

Mr. RUCKER. I do not question your judgment about it at all, in any wise, but I am apprehensive that when we went to cash it we would not get that much out of it. It may be I am clear wrong about that.

Mr. HOWELL. Are you authorized to dispose of the oak timber on this farm if you want to do it?

Dr. MELVIN. It could be done by condemnation proceedings; but we have not any desire to do it, except of those trees which are ripe and fit to cut, and as to those it has been a question in my mind whether they should be sold and the money turned back into the Treasury or whether we should use them on our farm in any way for buildings, sills, etc.

Mr. LAMB. If that is a good thing in oak timber, I would go over there and buy it.

Dr. MELVIN. It is fine.

Mr. HAUGEN. Did you employ an expert to make the estimate?

Dr. MELVIN. This was an estimate made by a man who had sawed up an adjoining and similar piece of timber.

Mr. RUCKER. I want to take off my hat to the department if you bought that land for less than the timber on it is worth. That is a marvelous transaction—for the Government to buy a piece of land and pay \$25,000 for it and find on 35 acres of it timber enough to

pay for the property. Of course somebody thinks it is worth that, but I would like to get it marketed.

Dr. MELVIN. You would be surprised if you should see it.

Mr. HAUGEN. Where is this land? Is it on the railroad going to Hyattsville?

Dr. MELVIN. It is beyond Hyattsville. It is on the main line between here and Baltimore.

Mr. HAUGEN. How far beyond?

Dr. MELVIN. It is about a mile from the depot.

Mr. HAUGEN. How far from Hyattsville?

Dr. MELVIN. It is beyond the Maryland Agricultural College, about 3 miles or 5 miles beyond that.

The CHAIRMAN. Will you tell us something about the progress of the work for the eradication of the southern cattle tick?

Dr. MELVIN. That work has been progressing along the same lines as heretofore. We have released from quarantine up to now about 130,000 square miles of territory since the work was commenced. This year I do not know definitely just how much we will have to release. We have not yet decided, but probably will release between somewhere about fifteen or sixteen thousand square miles.

Mr. LAMB. How many counties have you left in Virginia?

Dr. MELVIN. About six, I think.

Mr. LAMB. You have all that about Greenville and Brunswick?

Dr. MELVIN. Yes, sir.

Mr. LEE. Is your line extended to the southern Tennessee line?

Dr. MELVIN. In some places; not along the complete line there, but in several places we are down as far as the southern boundary line of Tennessee. This work has been taken up very vigorously by some of the States. Mississippi last winter passed an appropriation of \$35,000 for two years' work in tick eradication. They had, I think, previous to that, \$3,500 for the two years before that, and they had never had any before. So, you see, it is creating a great deal of interest. Mississippi is especially interested because the boll-weevil has entered there and they have to turn their attention to live stock.

The CHAIRMAN. Is not Mississippi wholly south of the quarantine line?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. How would stock going from the north get across the quarantined territory? Would there not be danger of its being infected?

Dr. MELVIN. They would have to go by rail. They could go through the quarantined territory by rail without danger of exposure or be shipped out. There is part of Tennessee that abuts on Mississippi that is clean, down to the line of the northern border of Mississippi, so there is clean territory there.

The CHAIRMAN. Do you not run a pretty large risk of having to do the work all over again when you go into the middle of the infected territory and clean out a small scope?

Dr. MELVIN. There is much more danger, there is no doubt of that, because you are surrounded by a zone of danger instead of only having one side from which you work down.

Mr. LEE. Along that line I would like to ask one question: How much is appropriated by Georgia? Do you remember?

Dr. MELVIN. None of this money is apportioned to any particular State.

Mr. LEE. I mean the State of Georgia.

Dr. MELVIN. By the State of Georgia?

Mr. LEE. Yes; just approximately. It is quite a little fund, is it not?

Dr. MELVIN. Yes, sir. They have just recently provided for a State veterinarian to look after this work, which they have not done before, and I think the State has appropriated something like \$5,000 or \$6,000. In Georgia the counties provide funds as well as the State.

Mr. LEE. Along that line, if the quarantine is extended to the southern line of Tennessee, say to Chattanooga, just below Chattanooga you can not drive cattle in at all, because there is no regulation; but in middle Georgia they are expending this money on the cattle-tick quarantine, and, as you say, of course it is infected all around. I think it is a poor expenditure of money.

Dr. MELVIN. These States must confine their efforts to the counties that are ready and willing to cooperate with them. If a county will organize and pass restrictions so that the cattle can not wander every place, pass what they call the "no-fence" law—the no-fence law means that every man must fence his cattle and not allow them to run at large. In other words, they are not required to have fences for their crops, but must fence live stock.

Mr. RUCKER. If they run at large, they never will get rid of the tick.

Dr. MELVIN. No, sir. Where a county will organize and pass such a law and put up funds to work with our men, that is, where they work, where they must work. The counties that will not do this we have to let alone until they will. We are entirely in the hands of the State and can only work where the State is willing to work.

The CHAIRMAN. In a general way, do you not try to carry on your work in territories contiguous to cleared territory?

Dr. MELVIN. Yes, sir; that has been the policy.

Mr. LEE. I think that is the only way you will get rid of the cattle tick.

Mr. LEVER. Is there any urgent necessity for the increase of \$25,000; any more urgent necessity than heretofore?

Dr. MELVIN. We feel that the more we can do within reason the better it will be; not to drag it out any longer than necessary.

Mr. HAWLEY. When do you expect to have the ticks eradicated from all the infested sections?

Dr. MELVIN. That is beyond my knowledge. Of course, there are so many factors that enter into it. We are absolutely powerless without the cooperation of the State, and the State can not do anything unless its people will. But there is no doubt in my mind where stock conditions prevail to any extent but what they are going to take it up, and take it up vigorously, because they have to do it; they see the improvement in live-stock conditions. In territory in Tennessee and other places, where I have had a man go, he finds in released territory a difference of from \$10 to \$15 in the price of a milch cow between there and where that same quality of cow is in a quarantined area. You can go to markets like East St. Louis, which is the largest southern cattle market in the United States, and Kansas City and Chicago, and the same kind of cattle selling in those markets vary from \$2.50 to \$10 a head as to whether they are in the quar-

antine pens or in the free pens. Those things are what is going to appeal to people, and where they have live stock they are going to eradicate ticks.

Mr. LEVER. Have you found any disposition among the people to refuse to cooperate with the Government in this work?

Dr. MELVIN. Those are exceptional cases, they are not general. The most opposition comes from people around town who have just one cow and she always has run at large, and they always want her to run at large, and they do not want her to be interfered with. But the stock growers themselves are in favor of it, they want to eradicate ticks and improve live-stock conditions.

Mr. LAMB. Could you tell me the increase in cattle in the last 10 years in this country?

Dr. MELVIN. No, sir; I have not those figures.

Mr. LAMB. I understand you have them over there in the department, that the increase has only been 18 or 19 per cent. Will you look into that and let us know if that is so?

Dr. MELVIN. Yes, sir; I will try to answer that.

Mr. LAMB. And I understand in that time hogs have decreased 17 per cent. I saw that in the papers, and I would like to know if it is so? (The statement is as follows:)

Estimated number of cattle and swine in United States January 1 each year 1901 to 1910.

[Estimates by Bureau of Statistics, Department of Agriculture.]

Years.	Milch cows.	Other cattle.	Swine.
1901.....	16,833,657	45,500,213	56,982,142
1902.....	16,696,802	44,727,797	48,698,890
1903.....	17,108,227	44,659,206	46,922,624
1904.....	17,419,817	43,629,498	47,009,367
1905.....	17,572,464	43,609,443	47,320,511
1906.....	19,793,866	47,067,656	52,102,847
1907.....	20,968,265	51,565,731	54,794,439
1908.....	21,194,000	50,073,000	56,064,000
1909.....	21,720,000	49,379,000	54,147,000
1910.....	21,801,000	47,279,000	47,782,000

Mr. LEVER. This cattle tick is a tremendous handicap upon the South. What would you regard as a sufficient appropriation, yearly, to wipe out the cattle tick in the next 10 years?

Dr. MELVIN. An annual sum, you mean?

Mr. LEVER. Yes.

Dr. MELVIN. I think this is probably about what we can use advantageously, \$275,000 to \$300,000 a year.

Mr. LEVER. Do you think that amount will clear this territory in 10 years?

Dr. MELVIN. I would not say about 10 years. I do not think all of it would be cleared in 10 years, but the bulk of it would.

Mr. LAMB. If the States cooperate, it will.

Dr. MELVIN. Yes; easily. If the States cooperate, we can do it easily. In the case of Florida, for instance, I do not think the State will ever care one way or the other. Their cattle interests are so small, comparatively, and most of the shipments they do make are to Cuba, where they have ticks.

Mr. LAMB. And they do not mind ticks in Cuba?

Dr. MELVIN. No, sir.

The CHAIRMAN. Do you do any of this work in counties where there is no cooperation at all in the way of State or other contributions to the cost?

Dr. MELVIN. No; I think not; we have not any. As a rule, we draw up a sort of contract—which, of course, has no penalties attached to it—between the proper State authority and our bureau, with reference to the part that each of us shall play in this tick eradication. We have never gone into any country where the State has not cooperated.

The CHAIRMAN. Can you give the aggregate sum of the appropriations which have come from various States and counties in the line of this cooperation?

Dr. MELVIN. I had that last year, and I may be able to get it this year, although I do not think we have gathered that this year. The funds come first from the States, then from the counties, and third from stock raisers.

The CHAIRMAN. In a general way, have you had more funds from that source, and more cordial cooperation this year than last, or less?

Dr. MELVIN. With the exception of the State of Texas, we have had more this year than before, all along the line.

Mr. LEVER. What is the matter with Texas?

Dr. MELVIN. They did not seem to be interested in it until quite recently. Their State inspectors did not control the movement of cattle within the State, and the Secretary, at my recommendation, threatened to quarantine the whole State unless they did control the movement of cattle within the State. That, of course, woke them up, and the incoming governor has promised to give this work his complete support, and has also promised to appoint a new live-stock board that will cooperate with our department in the work.

The CHAIRMAN. It is obvious we can not finish the consideration of this subject this morning, and so we will adjourn until 2 o'clock.

(Thereupon, at 12.35 o'clock p. m., the committee took a recess until 2 o'clock p. m.)

AFTERNOON SESSION.

The committee reconvened, pursuant to the taking of recess, at 2 o'clock p. m.

The CHAIRMAN. I believe, when the committee adjourned this morning, we had finished the discussion of the paragraph relating to the eradication of the southern cattle tick. If there are no further questions in connection with that paragraph, we will pass to the next. This provides an increase of some \$7,000 or \$8,000 on the face of it for expenses in connection with investigation and experiments in the dairy industry, cooperative investigations of the dairy industry in the various States, and inspection of renovated-butter factories and markets. There seem to be three different projects there, Dr. Melvin. Can you give us an idea of the distribution of this sum among those projects?

Dr. MELVIN. The division of this increase?

The CHAIRMAN. No; the distribution of the entire sum. Do you know how much you are spending each year for experiments in the dairy industry?

Dr. MELVIN. The present appropriation is \$147,600, I believe.

The CHAIRMAN. Yes; for the entire year.

Dr. MELVIN. That has been subdivided as follows: For administration, \$3,500; dairy farming, \$44,950; laboratories, including Storrs, Conn.; Madison, Wis.; Washington; and Albert Lea, \$38,044; dairy manufacturing, \$28,775; market milk, \$10,321; milk secretion, Columbia, Mo., \$5,000; renovated butter, \$12,010; for farm-operating expenses, \$5,000; making a total of \$147,600.

The CHAIRMAN. What do you mean by farm-operating expenses?

Dr. MELVIN. That is some of the expense that is now being paid on our Beltsville farm. There is some of the running expenses in connection with that that is now being defrayed both by the Animal Husbandry and the Dairy Divisions. The \$12,000 which was appropriated is being reserved for the erection of buildings and permanent improvements of that character.

The CHAIRMAN. You are paying the operating expenses out of some of these lump sums, this being one of them?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. Just what are you doing this year in the way of investigations and experiments in the dairy industry; anything new, or are you simply following up the work of former years?

Dr. MELVIN. It is nearly altogether along the line of the work which we have been doing heretofore of sending men in the field to work with the dairyman and instruct him with reference to improved dairy methods, like our southern dairy work, which we carried on for several years, and are now carrying on; and in addition to that, we have had a work in several places in other States inducing dairymen to keep closer records of their operations of the milk production of the individual cows, weighing their milk, so as to know exactly what returns they are getting from each cow. We get a group of farmers in one locality to enter into this arrangement so that they can be looked after readily, and one man will oversee the work in several of those districts. This has had the effect of showing these people that many of their cows were being kept at an absolute loss, so that they can weed them out and get productive cows, cows that will earn money.

The CHAIRMAN. Under this head, therefore, you are practically doing for the dairy industry the demonstration work which the Plant Industry Bureau is doing for the orchard and other farm interests?

Dr. MELVIN. Very largely. The same theory prevails in both.

The CHAIRMAN. Do you think you are getting good results?

Dr. MELVIN. Yes; I think we are getting very good results. We expect this work to be of a temporary nature, expecting the States to follow it up and take up this work as soon as they can obtain funds for doing so. In some of our dairy work in the South they have already taken it over. North Carolina, I believe, has, and there are one or two other States that are now about to provide men for this same work. Of course, as they take it up we will drop it.

The CHAIRMAN. That is right. What are you doing under the head of cooperative investigations of the dairy industry, a similar line of work, except that you cooperate with the State authorities?

Dr. MELVIN. We have been doing for several years cooperative work with some of the State stations, at Storrs, Conn.—that is, in the manufacture of different kinds of soft cheese. It has been carried on there for several years, and the same kind of work at Madison. At Albert Lea I think we will probably have to finish our work this year, as the arrangements there are not satisfactory. The intention was to have our men supervise closely the work at a large cooperative butter factory so as to demonstrate improved methods in the manufacture of butter.

In our laboratories at Washington we are not doing cooperative work, but we are carrying on quite an extensive line of research work with reference to the different flavors that obtain in butter, some of which are objectionable flavors, and some desirable flavors that are sought after, to determine the bacteria and chemical changes occurring which produce these objectionable and desirable flavors. We are also carrying on quite an extensive piece of work with reference to pasteurization of milk that is to be used without further processing, as to what chemical changes take place in the milk by pasteurizing. Also with pasteurized cream made into butter and into cheese. There has been a great deal of objection to pasteurization by a great many on the theory that the heating of the milk destroyed some of the desirable bacteria which should be retained in the milk—that is, the bacteria which produce souring—the claim being made that by heating the milk during pasteurization these bacteria were killed, so that the milk would go on and putrify without becoming sour and would be more harmful than if these bacteria remained. But we have so far demonstrated that by pasteurizing at lower temperatures, at 145° F., and maintaining the milk at that temperature for 20 minutes or so, you will not destroy all of these sour-producing bacteria. It is when it is heated at the higher temperatures that this occurs.

The CHAIRMAN. But you do destroy the dangerous germs?

Dr. MELVIN. The ordinary pathogenic bacteria which would be harmful are killed.

Mr. HAWLEY. Does that destroy any tuberculous germs that might be in the milk?

Dr. MELVIN. Yes, sir. A temperature of 145° for 20 minutes would be sufficient to kill any tuberculous germs or typhoid germs or germs of that character which might be in it, without, we think, being detrimental in any way to the milk, and it is to make further investigations along that line that we are doing that work.

Mr. HAWLEY. In one of the recent magazines there was an article where the word used was not exactly "graft" in the pasteurizing process. Did you read the article?

Dr. MELVIN. No; I do not believe I read that article. I know there has been some claim made that the advocates of pasteurization were working in the interest of some trust that controlled these pasteurizing machines.

Mr. HAWLEY. I was interested to know if any of the statements they made there regarding the quality of milk after the pasteurizing process were accurate.

Dr. MELVIN. I have not seen the article, and I could not speak on it.

The CHAIRMAN. The work of inspection of renovated butter, I presume, is thoroughly routine?

Dr. MELVIN. Very largely, though we have been trying to give that more attention during the last two years than heretofore, and have spent more money in that direction than heretofore, in the way of requiring better sanitary conditions in these renovated-butter factories, and in inspecting more closely the butter that was used in renovating. We have destroyed quite a considerable quantity of butter which we considered unfit even for renovating. We have been able to carry on a considerable amount of this work in connection with our meat-inspection work, and it was a feature that I think ought to be explained. At some of the large packing houses they also renovate butter, and at such places at which we have had men who are also engaged in meat inspection, we have had them give this the supervision necessary. This, of course, did not require any addition to our meat-inspection force nor any expenditure of funds. In some cases, where the butter factory was removed from these places, the meat inspectors have supervised such places, but all incidental expense connected with it has been paid out of this fund. We find in much of our work that one man will be performing work which might be paid for out of two and sometimes three different funds, and we aim to regulate that by having the man paid from the fund for which he is doing the bulk of his work. That seems to be about the only way we can do the work economically.

The CHAIRMAN. Do you think it would embarrass you particularly in the work provided for under this paragraph if it should be segregated into the items you mentioned a few moments ago?

Dr. MELVIN. The renovated butter?

The CHAIRMAN. I mean the whole paragraph here.

Dr. MELVIN. Subdivided in the bill?

The CHAIRMAN. Yes.

Mr. LAMB. How was this last year, the same as it is now?

The CHAIRMAN. No. You will notice there has been some slight increase.

Mr. LAMB. I do not mean that; I mean the statement.

The CHAIRMAN. The statement is the same; yes.

Mr. McLAUGHLIN. If a number of employees can be paid partly from one fund and partly from another the aim of this segregation is defeated, is it not?

The CHAIRMAN. I presume that that is one of the things which would bring about some degree of embarrassment if the segregation were made.

Dr. MELVIN. It would in many instances, because the same men in the same office do more or less work in all of those lines of work, or in several of them, at least. To give a specific illustration, we have men in the stock yards who are inspecting live cattle, part of their work under the meat inspection and part of it under contagious diseases of animals operations. The same men can do the two kinds of work just as well as having two separate forces, and much more economically.

Mr. HAWLEY. When they make the meat-inspection examination they also make a contagious-disease inspection, at the same time?

Dr. MELVIN. At the same time, the same men, and yet technically they are doing two different kinds of work.

Mr. HAWLEY. They inspect the animals on both those subjects at the same time?

Dr. MELVIN. Yes, sir. That would be the case in a great deal of this work, that the same men would be doing work in two or three different projects.

The CHAIRMAN. All the projects provided for under this paragraph are under the general direction of one man, are they?

Dr. MELVIN. Yes, sir; the dairy division. I think that if the funds for divisions themselves are kept separate that would be about as small a subdivision as could be practically made.

The CHAIRMAN. Passing to the next paragraph, we find some new language and a considerable increase in the appropriation. The new language consists of the words "and for supervision of pedigrees of imported animals." Will you give us, briefly, your reasons for asking that this language be inserted?

Dr. MELVIN. The supervision of the pedigrees of imported animals is a rearrangement of a line of work which we have had for some time, which is the free importation of pure bred animals for breeding purposes. Heretofore we have accepted, as pure bred, animals which were eligible for registry in certain books of registration which the department had accepted as being standard. Now it is proposed that under the reading of the law, the tariff act, the department will actually supervise and inspect the pedigrees themselves, irrespective of the books of record. I will ask Mr. Rommel to speak on that. I can hardly speak.

The CHAIRMAN. In the course of your statement, Mr. Rommel, I wish you would answer the question as to whether the Treasury Department, in years past, has appealed to the Bureau of Animal Industry to determine the question as to whether a given animal shall be admitted free of duty?

Mr. ROMMEL. Yes, indeed. They have no option in the matter, as we have always been advised, and as they themselves hold. The tariff act providing for the importation of animals free for breeding purposes specifically states that the Secretary of Agriculture shall determine and certify to the Secretary of the Treasury what are recognized breeds and pure bred animals, and the Treasury has always held that under that they had no option, that if the Secretary of Agriculture said such and such an animal was not pure bred it could not come in free of duty; on the other hand, if the Secretary said it was, it had to come in free.

Mr. McDERMOTT. Does your department write to the foreign countries and ask for the registration in their books to be certified?

Mr. ROMMEL. Yes. We have required, until recently, registration in an American certified book of record. About a year or so ago we discovered that there was something wrong in the importation of animals, and after a certain amount of investigation we found that some importers had been building up a practice of bringing in a few animals and a great many pedigree certificates. There have been, in the last three years, something like 150 horses of one breed registered as imported that never saw the other side of the water.

Mr. HAWLEY. And they attach those pedigrees to animals born in this country?

Mr. ROMMEL. Yes, sir, which they buy for three or four hundred dollars apiece and sell for up to three or four thousand dollars.

The CHAIRMAN. Is the furnishing of these pedigrees independently of the animal an established and recognized industry in Europe?

Mr. ROMMEL. I am not prepared to say. We do not know whether these pedigrees are furnished over there, or whether they are forged here. We never have gone that far into it. We do know that a great many animals have been registered in the United States as imported that were never imported.

Mr. RUCKER. Is there any penalty?

Mr. ROMMEL. There is none, so far as the Federal statutes are concerned.

Mr. RUCKER. Should there not be, is the question.

Mr. HAWLEY. Have you any one instance where you have traced an alleged pedigree and found that it was not imported with the animal?

Mr. ROMMEL. Yes, sir; we have something like 150 in the last year. Some of those may be cleared up by the importer stating that perhaps he brought in a certificate and found it was incorrect and sent it back for correction. The incorrect pedigree would then appear in the customs records; the correct pedigree would appear on the books of the American association.

Mr. McLAUGHLIN. Would the customhouse have anything to do with the domestic animals, those born and bred in this country?

Mr. ROMMEL. Absolutely nothing.

Mr. McLAUGHLIN. Even if a foreign pedigree were attached to them?

Mr. ROMMEL. Nothing at all; and it appears, from our investigations, that the only way to break up this custom is for the Secretary of Agriculture to do exactly what the law says, entirely disregard the American associations and have the department itself pass on the sufficiency of the pedigrees of animals imported for breeding purposes.

Mr. McLAUGHLIN. That would not reach this difficulty.

Mr. ROMMEL. It would in this way, that we will publish at frequent intervals a list of the pedigrees of such animals that have passed the customs officers free for breeding purposes.

The CHAIRMAN. Could you not do that with the law as it stands?

Mr. ROMMEL. Certainly.

The CHAIRMAN. Then just what do you want to do by the insertion of this language which you can not do now?

Mr. ROMMEL. We simply have to add to our force. We have had one man who has been engaged in connection with this work of keeping track of American associations. Now, when we come to the matter of examining the pedigree of every animal imported for breeding purposes, this is going to take an increased force.

The CHAIRMAN. I can understand how that will require more money, but I do not see how it will necessitate new language in this bill.

Mr. ROMMEL. I do not particularly see that it does, except that it makes it specific. The authority is in the tariff act, Mr. Chairman.

Dr. MELVIN. The new language was inserted, I think, for the purpose of explaining the necessity for the increase.

The CHAIRMAN. Since that explanation has been made, I am inclined to think we had better strike out the new language. It would be a peg upon which to hang a point of order in the House, and we would have to go through a long explanation to show why it was needed.

Dr. MELVIN. I do not think there is any objection. I think the authority is vested in the Secretary through the tariff act to do this.

The CHAIRMAN. It seems so to me.

Dr. MELVIN. The only reason it is here is to explain an increase in the appropriation.

Mr. HAWLEY. Have you made any inquiry on the other side of the water, and made any examination and investigation on the other side of the water, to see if any breeder of animals over there was selling an animal with a spurious pedigree?

Mr. ROMMEL. Yes; we have looked into that.

Mr. HAWLEY. Have you found any such instances?

Mr. ROMMEL. Specific?

Mr. HAWLEY. Yes.

Mr. ROMMEL. No, sir.

Mr. HAWLEY. You have well-founded suspicions, I gather.

Dr. MELVIN. We have carried it up to the point of buying the animal, but we did not have the money to buy the animal; therefore we did not absolutely do it.

Mr. HAWLEY. Would the man agree to give you several pedigrees with the animal?

Dr. MELVIN. No; but he would give you a passing pedigree with an animal that was not pure bred.

The CHAIRMAN. In other words, he was prepared to give you a pedigree of an imported horse and to sell you a horse that was born in this country; is that what I am to understand?

Dr. MELVIN. In this particular case it was a foreign horse, but a spurious pedigree.

The CHAIRMAN. There is one point I would like to have a little more clearly in mind than I have now, and that is in just what way you propose to discourage this industry of selling native horses supplied with imported pedigrees?

Dr. MELVIN. The only way, Mr. Chairman, that I think we can reach that at all will be by certifying to the genuine pedigree certificates, and certificates of pedigree of alleged imported horses without the certification of the department appearing upon them will be known as spurious. Mark each genuine pedigree certificate with the approval of the department.

The CHAIRMAN. You would give notice throughout the country that, beginning with a certain date, all genuine pedigrees of imported stock would bear the certification of the Department of Agriculture?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. So as to put everybody on notice that without such certification they were being defrauded?

Dr. MELVIN. Yes, sir.

Mr. HAWLEY. How do you purpose to reach the difficulty you have just mentioned, of a foreign breeder selling a poor animal as pure blood?

Dr. MELVIN. That will have to be through investigations made abroad, and by keeping in close touch with the books of record on the other side, they knowing that with the penalty holding over them if fraud is perpetrated by those foreign books of record they will not be further recognized.

Mr. HAWLEY. Do you purpose to make an examination abroad of the pedigree and the reliability of the pedigree of any animal brought into this country?

Dr. MELVIN. That might be necessary; not constantly, but occasionally. We will examine the certified pedigree in connection with these horses as they arrive. The trouble has been confined almost entirely to horses.

Mr. HAWLEY. Are there many breeders abroad who are willing to give spurious pedigrees?

Dr. MELVIN. I do not think that there are. I could not answer that particularly.

Mr. LAMB. What proportion of this \$55,000 estimated for in this paragraph do you think would likely go to the supervision of pedigrees of imported animals?

Dr. MELVIN. \$10,000.

The CHAIRMAN. About what are you spending for that now?

Dr. MELVIN. I think it is about the service of one man; probably about \$1,500 or \$2,000.

The CHAIRMAN. Do you expect you would have to send a man abroad?

Dr. MELVIN. It might be necessary. I am merely stating that as a possibility, although we have not that in mind at present. If we were suspicious of a fraud being practiced, it might be necessary to send some one over.

Mr. RUCKER. I suppose those are breeding horses you are speaking of?

Dr. MELVIN. Yes, sir; horses imported free for breeding purposes.

Mr. RUCKER. About how many of them are imported annually?

Dr. MELVIN. About 5,000.

The CHAIRMAN. Where are you carrying on investigations and experiments in animal husbandry?

Mr. ROMMEL. At the experiment station at Bethesda, principally. In fact we have one small laboratory in the Department of Agriculture Building, where we propose to take up some investigations of incubation. Our work at Bethesda with poultry and with sheep and goats occupies a certain amount of this. One of the principal items under this appropriation is a study of poultry on the farm, particularly of eggs, with the idea of improving the quality of eggs produced in the country, saving the waste that now exists. We estimate that about 15 per cent of the total valuation of the eggs are lost every year through bad methods of handling before the egg ever gets to the packer. Only 2 per cent of that amount is due to breakage, 13 per cent is due to bad handling on the part of the farmer and the country store.

We have had in the last six months two men in the field devoting their time to the study of that subject. We located them in Kansas, and their work has been largely of an educational nature. They have been showing the farmers how to take care of their eggs, so that they will not deteriorate in quality, and they particularly have been getting

at the country store. An organization of the buyers has been effected there that has cooperated with the State board of health, and they have bought those eggs on what is known as a "loss-off" basis; that is to say, they have paid for the good eggs and have not paid for the rotten eggs. Formerly they bought on the "case count" basis, and paid for all the eggs in the case, no matter whether they were good, bad, or indifferent. The result of that work during the six months it has been in progress is that the Kansas egg, instead of being one of the inferior eggs on the western market, has been of higher quality during the last summer than eggs received from other States at such markets as Chicago, New Orleans, and Detroit, just through an educational campaign in that one State.

The CHAIRMAN. I noticed this summer in every grocery store I happened to drop into, a warning from the State Board of Health very conspicuously displayed, threatening with heavy penalties anyone attempting to sell a bad egg. Was that done at your suggestion?

Mr. ROMMEL. Yes, sir.

The CHAIRMAN. Can you state briefly what suggestions you make to the farmers to improve their methods of handling?

Mr. ROMMEL. Yes, sir; that can be stated briefly. As I say, the first thing that was done there was to get this organization of buyers to agree to buy good eggs. It is useless for the farmer to produce a good product at considerable trouble unless there is somebody willing to pay him for it. The egg buyers in Kansas got together and organized the Kansas Car-lot Shippers Association. They notified the egg stores that they would candle the eggs, and determine their quality. They would pay for those eggs on a "loss-off" basis. Then our men went to the Kansas State Board of Health and got them to agree to put out the warnings that you have spoken of. The work with the farmer has been direct educational work, our men visiting the farmers and showing them how to take care of their eggs; telling them that if they put a case of eggs out on the depot platform in the sun, with a temperature of 120°, and leave them there all day long, the eggs are going to spoil, things like that; telling them if they send a case to country store and the storekeeper puts them where the heat gets to them, they are going to shrink and are going to spoil. I think that is all there is to it. It is a personal campaign, backed up by the forces you have referred to. That work ought, perhaps, to continue there, so that we could use it as an object lesson in other States; I think we could get all the data that we need in the State of Kansas.

The CHAIRMAN. You speak of establishing a laboratory in the department for the study of incubation. Will you elaborate on that?

Mr. ROMMEL. That is for purely scientific studies of changes in the egg during incubation, particularly those changes and the conditions of environment that have to do with the hatching quality of the egg and the vitality of the chick after it is hatched.

Mr. McLAUGHLIN. Is there not some work in the animal husbandry line being done on a farm in Vermont as a gift to the Government?

Mr. ROMMEL. Yes, sir. That work is being paid for under a different appropriation. That has not been taken up yet.

Mr. HAWLEY. Are these spurious certificates that are furnished with imported animals furnished principally with stallions or mares?

Mr. ROMMEL. Ordinarily with stallions, although there are some very notable instances where mares have been so fixed up.

The CHAIRMAN. Passing to the next paragraph, we find an apparent reduction in the appropriation. Do you know whether that is actual?

Dr. MELVIN. No, sir; that amount will be the same as it is this year, the difference being in the transfer of a number of people from the lump fund into statutory positions.

The CHAIRMAN. Have you a statement before you showing the distribution of the fund provided under this paragraph?

Dr. MELVIN. No; I have not. I can explain that, though.

The CHAIRMAN. Can you give us an idea of the amount of money spent during the current year, or last year, for construction?

Dr. MELVIN. I do not think we spent any money there for construction last year. The only object in having that in there is in case we have to erect a building at some time which we could not anticipate, as we did during the foot-and-mouth work. We made an experimental investigation there with vaccine virus, and we built a special building for that purpose, constructed especially for that experiment. Without some authority of this sort I doubt if we could have done that. We are not anticipating putting any new buildings there.

The CHAIRMAN. Do you suppose you could learn from your books what you have spent for construction at Bethesda over a period, say, of the last five years?

Dr. MELVIN. Pretty closely; yes, sir.

The CHAIRMAN. I wish you would let me have that information if you can.

Dr. MELVIN. Yes, sir.

(The statement is as follows:)

Buildings at Bethesda Experiment Station.

1907:		
1 incubator house.....	\$250	
1 office house.....	300	
1 feed house.....	500	
1 chicken house.....	2,000	
1 feed house.....	2,000	
2 stables, at \$225 each.....	450	
1 pump house.....	125	
		<hr/>
		\$5, 625
1908:		
5 stables, at \$250 each.....	1, 250	
1 zebra house.....	750	
1 foot and mouth stable.....	750	
Completion laboratory.....	5, 500	
		<hr/>
		8, 250
1909:		
5 stables, at \$250 each.....	1, 250	
1 small animal house.....	5, 500	
1 pump house.....	150	
		<hr/>
		6, 900
1910: 3 stables, at \$275 each.....		825
		<hr/>
		825
		<hr/>
		21, 600

The CHAIRMAN. Passing to the next paragraph, we find an estimate of \$25,000 for the necessary expenses involved in continuing the equipment of the farm at Beltsville, the construction and repair of

fences, maintenance of farm, etc. We discussed that pretty carefully this morning.

Mr. LAMB. I would like to ask this question: Why could not Bethesda and Beltsville be consolidated? Is there not room at this Maryland place for the zebra and the rats?

Dr. MELVIN. We are taking over that work at Beltsville. The only work we expect to leave at Bethesda will be our investigations in reference to diseases of animals, and I would not advise the change of that station at this time, because it will involve quite a considerable additional expense. We are all provided for this work at Bethesda, and I think it will be economy to leave that there.

Mr. LAMB. Bethesda would bring a big price?

Dr. MELVIN. You would have to appropriate more money. We would take it out of one pocket and put it into another. If Bethesda was sold, the money would probably have to go back into the Treasury.

Mr. LAMB. The money coming from Bethesda would build the new buildings at this new place, Beltsville, and the exchange would be fine. Then, with the sale of the 30 acres of lumber, you would be making money.

Dr. MELVIN. There would be some objection to having the two together. The principal objection would be handling diseases of animals on the same farm with the others.

Mr. LAMB. I suppose that would be the chief trouble.

The CHAIRMAN. Have you made a distribution of the funds under this paragraph for your guidance?

Dr. MELVIN. For Beltsville?

The CHAIRMAN. Yes.

Dr. MELVIN. No, sir; that was estimated only. We have not arrived at a definite plan of work there yet.

Mr. COCKS. Have you fences already constructed over there, or an outside fence?

Dr. MELVIN. It is not completed; it is partially constructed.

Mr. COCKS. Is it all alike, the same kind of posts and the same kind of wire?

Dr. MELVIN. Yes, sir.

Mr. COCKS. Have you tried any experiment with the treatment of the posts with the various methods that are recommended by the other bureaus of the department?

Dr. MELVIN. We have not done that. We were so late in getting it that we wanted to get the fence around the property to protect it; we hardly had time for doing it. The posts we are using are cedar posts, which are obtained in this locality. Most of them have been cut on the place. We have almost enough posts on the property to fence it.

The CHAIRMAN. Was there no fence on the property when you got it?

Dr. MELVIN. Not good fence; all tumbled down.

Mr. COCKS. It occurred to me it might be a good place to try some experiments in fencing, as well as anything else. We have the farm, and they are all the time recommending different treatments.

Dr. MELVIN. We may do that yet. We have been considering reinforced concrete, for one thing, and different kinds of posts of wood.

Mr. HAWLEY. Did you set the posts green?

Dr. MELVIN. No; they were seasoned first.

The CHAIRMAN. The next paragraph provides for general administration work and is an apparent decrease. As a matter of fact, is there any reduction in that paragraph?

Dr. MELVIN. I think the same explanation applies there as in some of the others—that the apparent decrease is due to the placing of some of the persons in statutory positions.

The CHAIRMAN. Are the salaries provided in this paragraph all paid to people employed in Washington?

Dr. MELVIN. Yes, sir; all the money under that fund is used for expenses in Washington.

The CHAIRMAN. Can you tell how many clerks are employed and paid from this appropriation?

Dr. MELVIN. I do not think I could, but I think I can furnish that to you.

The CHAIRMAN. How does it happen that the employees engaged in this work, general administration work, are not carried on the statutory roll? Perhaps it will help you to answer that question if you will turn to page 17 of the estimates, where, under the heading "Administrative expenses," you will find a list of the employees, most of whom seem to be scientists, and I presume on that account would be excepted from the general provision requiring their salaries to be carried on the statutory roll?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. But there do appear two clerks at \$1,600 each, some messengers, and charwomen, and laborers. Would they not be required, under the provision carried in the last bill, to be passed over to the statutory roll?

Dr. MELVIN. I think this arrangement is under the present appropriation, is it not, Mr. Zappone?

Mr. ZAPPONE. Yes; they have all been transferred, and go to make up that \$5,000, which is absolutely for the transfer of places from the lump fund.

The CHAIRMAN. They have all been transferred except the scientists?

Mr. ZAPPONE. All except the scientists.

Dr. MELVIN. Yes; they will be.

The CHAIRMAN. Are the scientists provided for under this paragraph appointed through the civil service?

Dr. MELVIN. Yes, sir. There is one expert in stock investigations who probably is provided for outside of civil service. Most experts and agents are permitted to be appointed outside of civil service, but others are not.

The CHAIRMAN. Let me ask Mr. Zappone to cite us the law, if he remembers it clearly, which provides for the appointment of certain employees in the Department of Agriculture outside of the civil service? Is there a general statute?

Mr. ZAPPONE. It is not a general statute, but a civil-service regulation. Experts and special agents may be appointed outside of the civil service, but all such appointments must be promptly reported to the commission, and each appointee must file with the commission a written statement under oath, setting forth in detail his peculiar qualities or attainments along the lines of the employment desired. He must satisfy the commission that he possesses the peculiar quali-

fications necessary for the work. Agents are never employed in the city of Washington, and usually perform temporary service.

The CHAIRMAN. I believe that concludes the Bureau of Animal Industry, with the exception of the paragraph on page 20.

Mr. HAWLEY. There is one on page 85, Mr. Chairman.

The CHAIRMAN. Let us take the one on page 20 first, "Cooperative experiments in animal feeding and breeding," for which the usual appropriation is asked. Have you anything special to report in the way of progress or results?

Dr. MELVIN. There has been no material change in any of that work during the past year, nor do I think any is anticipated. The conditions are about the same now as last year, and it is expected they will continue about the same. There is nothing special to say.

The CHAIRMAN. In connection with the permanent appropriation on page 85, for the meat-inspection service, the amount in the last column shows simply what was expended, does it not, during the year 1910?

Dr. MELVIN. Yes, sir.

The CHAIRMAN. The permanent appropriation calls for \$3,000,000, but it appears that the amount actually needed for the fiscal year was only \$2,957,980.80, so that the entire appropriation was not used?

Mr. ZAPPONE. Those figures are inserted each year by the Treasury Department and represent the actual disbursements to date for the particular year to which they refer.

The CHAIRMAN. I suppose you are not able to make an estimate at this time as to the amount you will be able to turn back into the Treasury from that appropriation this year?

Dr. MELVIN. I think it will be less than last year. We will need very close to the entire three millions.

Mr. McLAUGHLIN. There is a law that requires or permits you to establish a quarantine forbidding importation of animals from foreign countries where there are diseases or infections, or whatever they may be called. Have you been called upon to exercise that authority recently?

Dr. MELVIN. We have done so quite recently with reference to the importation of horses and animals from China. The department has recently issued an order prohibiting the importation of horses and animals from Asia on account of the danger of introducing a disease called surra.

Mr. COCKS. To what part of the country would they be likely to be shipped?

Dr. MELVIN. There were some shipments made into Washington, I think Seattle, or Portland, Oreg.; some place up in the Puget Sound district.

Mr. McLAUGHLIN. When you act under that, do you designate the particular portion of the country, or do you make it general and forbid importation from an entire country?

Dr. MELVIN. We specify the countries from which importation is prohibited.

Mr. McLAUGHLIN. Have you ever designated particular portions of a country?

Dr. MELVIN. In an informal way. During the recent outbreak of foot-and-mouth disease in the northern part of England we infor-

mally refused to permit the importation of cattle from England, but did permit them to be shipped from Scotland and the Channel Islands. But the department did not issue a formal order to that effect. We did not consider it necessary. The department was in close enough touch with the sanitary officials of Great Britain to regulate that without a formal order.

Mr. McLAUGHLIN. A bill has been in the hands of this committee that will provide for a quarantine in the case of nursery stock, permitting the Secretary of Agriculture to quarantine against nursery stock from foreign countries, and it was said it was drawn along lines similar to the law under which your bureau is operating. I did not know but that we might get some suggestion as to the manner in which that law was executed by talking with you about it.

Dr. MELVIN. So far as some countries are concerned, importation is prohibited. Permits are required from all countries from which animals are permitted excepting North American countries, and these permits are only issued prior to the importation. So, in that way, the Secretary can reach the matter by issuing or withholding these permits.

Mr. McLAUGHLIN. Do you find that if you threaten to quarantine unless there is better inspection or more care exercised in the giving of the certificates or permits your requests are complied with and it is not necessary for you to establish a quarantine?

Dr. MELVIN. It does not work out just that way. In the event some contagious disease which we are in dread of is present in a foreign country we then schedule against that country, and will not issue a permit for cattle or other live stock which might be dangerous to come from there. The permit is issued by our department, not abroad.

Mr. McLAUGHLIN. In some cases are not permits issued by foreign countries or certificates given with the exportation from foreign countries?

Dr. MELVIN. Yes; in the case of imported animals. We require the certificate. We also depend on our own knowledge of the condition of diseases in the country, together with our inspections and quarantine after arrival in this country.

Mr. McLAUGHLIN. And wherever it has been necessary for you to establish a quarantine have conditions improved so that you could remove it?

Dr. MELVIN. They have in some cases. For instances, in Great Britain we have reduced the time of quarantine on cattle considerably on account of the eradication of contagious plural pneumonia in that country. While we used to quarantine for 90 days, we now quarantine for only 45 days, including the time of shipment.

Mr. McLAUGHLIN. How do you keep informed as to conditions in foreign countries?

Dr. MELVIN. We usually get reports regularly from the authorities of those countries. Nearly all of the European countries make reports regularly regarding diseases in their countries. Consuls also report outbreaks of disease among animals.

Mr. McLAUGHLIN. Do you depend on those reports, or has it ever been necessary for you to send officials from your bureau into foreign countries in those cases?

Dr. MELVIN. We have in some cases sent men to investigate. We did last year send two men to investigate conditions in Honduras. There was an effort made to import cattle from Honduras, and I was satisfied that tick fever existed there, and under those conditions, and under the law, we could not permit the importation. So those who desired to make these importations put up sufficient money to pay the expenses of the men down there and back, and we let them go. They were gone about six weeks and made a sufficient canvass to determine that the ticks do exist there. I presume they exist all the way from the northern tick border of our country down to the southern tick border of Argentina. I have no doubt but what they do.

Mr. HAWLEY. Have you imposed a quarantine on any section of a country?

Dr. MELVIN. Not abroad, except, as I say, in Great Britain, and that was more or less informal. Mexico is an exception.

Mr. RUCKER. You think it is sufficient to quarantine against the section infected and not against the whole country, do you?

Dr. MELVIN. One could hardly do that unless the foreign country would undertake to look after that particular district that was quarantined. Otherwise they could remove stock from that district to an unquarantined section and export from there to this country, so that unless an understanding was had with the foreign government that they would enforce that local quarantine could it not be effective.

Mr. RUCKER. If the property sought to be imported was not live stock, but nursery stock, which was growing—

Dr. MELVIN. We could do the same thing there. For instance, take our tick eradication work. We quarantine half of a State, and it is done with an understanding with the State that they will enforce the quarantine in that dangerous part of the State and not permit live stock to go from that quarantined section into the unquarantined part.

Mr. RUCKER. Have you ever known a territory in which disease was present to ship their stock from one part of it to another in order to evade the restrictions?

Dr. MELVIN. Yes, sir; we had that last year.

Mr. McLAUGHLIN. How long was the State of Michigan quarantined on account of the foot-and-mouth disease a year or two ago?

Dr. MELVIN. I think about two months or two months and a half.

Mr. McLAUGHLIN. That quarantine forbade the exportation from Michigan of what kind of stock and what kind of products?

Dr. MELVIN. The quarantine first included the whole of Michigan, and then, after learning the extent of disease within the State and after an understanding with the authorities of the State that they would enforce a local quarantine, it was modified so as to apply only to about two or three counties about Detroit, and it included cattle, sheep, and swine, and hay, straw, and fodder of that sort.

Mr. McLAUGHLIN. Horses?

Dr. MELVIN. No; it did not include horses.

The CHAIRMAN. You said a moment ago that some parties who desired to import cattle from Honduras put up the money to pay the expense to send a couple of your scientists down there to investigate conditions. I would like to know just how you managed the financial part of it. Did the money those men put up go into the Treasury?

Dr. MELVIN. No; the money was deposited with the disbursing officer of our department, and these men rendered their accounts in the usual way that they would for expense incurred under the department service. The disbursing officer paid their bills and refunded the unexpended balance.

Mr. HAWLEY. Did they pay the salaries of these men during that time?

Dr. MELVIN. No, sir; they did not pay the salaries; they only paid the travel and subsistence.

Mr. DERMOTT. Out of the three millions you have two million six hundred and seventy-five thousand odd dollars, on page 20.

Dr. MELVIN. That is for salaries and other expenses.

Mr. DERMOTT. How much other expenses will there be?

Dr. MELVIN. There are other expenses up to about \$60,000.

Mr. McDERMOTT. Out of 896 meat inspectors what percentage of them have been in the department three years—50 per cent?

Dr. MELVIN. Yes; I should think fully that; about that; maybe 60 per cent.

Mr. McDERMOTT. Would you object, then, about the middle there, to making that 500 meat inspectors at \$1,100 a year and 396 at \$1,000 a year—it only makes a difference of \$50,000—if I offer that as an amendment?

Dr. MELVIN. I would advise against increasing in one class without being able to extend it to all classes.

Mr. McDERMOTT. It will increase all over three years.

Dr. MELVIN. The inspectors' assistants are the lowest paid.

Mr. McDERMOTT. Regular meat inspectors that have been on three years, increase their salaries to \$1,100.

Dr. MELVIN. I would not want to make a flat recommendation of that kind, because I think it ought to be qualified in some respects. I do not think they are all equally deserving, and it ought to go to those who have earned it and not to those who have not.

Mr. McDERMOTT. What per cent do you think ought to get it that have been on over two years? We all know that at \$1,000 a year, living in the big industrial districts like Chicago, East St. Louis, Kansas City, and Omaha, a man raising a family can hardly live now on the existing prices.

Mr. COCKS. He can with some curtailment, can he not?

Mr. McDERMOTT. They can with some curtailment, but they like to raise their families, send their children to school, and have some of the comforts.

Mr. COCKS. I did not mean curtailment in salaries, but in expenses.

Mr. McDERMOTT. Would you favor that?

Dr. MELVIN. I would try to make an arrangement.

Mr. McDERMOTT. Could you arrange that so that next year we might—

Mr. LAMB. I would suggest to our colleague that that lies with the committee, and he might make his application to the committee.

Mr. McDERMOTT. Mr. Chairman, I would like to have a course agreeable to Dr. Melvin. I am anxious to have these men's salaries increased. Everybody else has been increased but these men. Since the act was passed in 1906 they have never received an increase.

Mr. STANLEY. Dr. Melvin might throw light on the advisability of the amendment.

Mr. LAMB. We asked him along that line this morning.

Dr. MELVIN. I think I stated this morning that I would much prefer to have that amount, the \$3,000,000 permanent appropriation, remain with the additional sum of \$250,000, in order to adjust the salaries along the basis which these men expected and to provide for additional work.

The CHAIRMAN. That is my understanding of what the doctor said this morning, that if the appropriation could remain in a lump sum, as it has heretofore, and could be increased sufficiently to permit it, it would be his wish to establish a regular flow of promotions through which the deserving man could pass from a lower to a higher salary.

Dr. MELVIN. Yes, sir.

Mr. McDERMOTT. Then you would not have to change the existing law; you could make a special appropriation of \$200,000.

The CHAIRMAN. Have you anything further to offer?

Dr. MELVIN. No, sir.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 13, 1910.

**STATEMENT OF DR. HARVEY W. WILEY, CHIEF BUREAU OF
CHEMISTRY, DEPARTMENT OF AGRICULTURE.**

The CHAIRMAN. We will take up the Bureau of Chemistry, page 52, and I will ask Dr. Wiley, the chief of that bureau, to favor the committee first with any general introductory remarks he desires to make touching the work of his bureau during the current year, and then pass to the consideration of the details of the estimates.

Dr. WILEY. Mr. Chairman and gentlemen of the committee, I can only say a few words in the way of introduction. The work during the past year and also the current year up to the present time has been largely in the line of previous years' work. Our work is divided into a number of divisions. The principal part of our activities are those connected with the duties imposed upon the bureau by the food and drugs act, the securing of samples of supposed foods and drugs that are adulterated or misbranded, both those going into interstate commerce and those coming into the country from foreign countries. We have not established any new laboratories since the last report. We have our central laboratory in Washington and 22 or 23 laboratories at the various ports of entry and throughout the country. Our regular work in connection with agricultural investigations has gone on the same lines as before, and will be brought out in the detailed estimates which we have prepared and which we have submitted to this committee.

Before making any recommendations at all I consulted with the Secretary of Agriculture, who had imposed upon us the necessity, if possible, of curtailing the expenses and the slight increases which we have asked for were not made by me originally, but after the original estimates were made, in consultation with the Secretary himself, so they met with his approval before they were ever offered at all on my part. I endeavored to keep the estimates within and below those of last year. But there were some special expenditures which have arisen since I made that estimate, and which came to the Secretary's knowledge through my reports and others, which made it advisable on his part to ask for some additional appropriations.

I will say that I believe we have succeeded in transferring all of the clerical force, all of the inspection force, and all of the force known as "laboratory helpers and laborers" to the statutory roll. There may be one or two exceptions to that which I do not know about, but as far as I know they have all been transferred. This makes a redistribution of funds, Mr. Chairman, with an apparently large increase in the statutory provisions and a corresponding decrease in the lump sum. That is explained in detail in the estimates which we have submitted.

There are some expenditures incident to our work which we can not foresee, and as a result of this we were forced to come to Congress for an emergency appropriation, and it is in the hope of avoiding that event again that these small increases have been made. I refer particularly to the expenditures in connection with the courts.

The CHAIRMAN. Perhaps we had better postpone consideration of that matter until we reach the paragraph under which it comes, and if you have nothing further to offer in a general way, we will take up the estimates as they appear, beginning on page 52. I notice by the notes that accompany these estimates that, with the exception of three clerks, there are no new places, all the additions to the statutory roll being accounted for by the transfers from lump sums. Have you anything to say in addition to the three new places which you ask us to create?

Dr. WILEY. The first, Mr. Chairman, is the \$200 increase for our chief clerk. I believe that has been explained to you.

The CHAIRMAN. Will you discuss that?

Dr. WILEY. The chief clerk of the Bureau of Chemistry is, I think, as fully occupied as the chief clerk of any bureau, and he has a smaller salary at the present time than any other chief clerk of a bureau of similar size in the department.

The CHAIRMAN. How long has he had his present salary?

Dr. WILEY. He has had this place now for four years, and he is a most efficient man, a married man having a small family, and I think it is only just to him that this slight increase, after so many years of service, be made, to put him in the same rank as other chief clerks; not to the highest of them, but to the lowest of them.

The CHAIRMAN. Is his work any heavier now than it was last year or the year before?

Dr. WILEY. I do not know that it is much heavier. The volume of the work is slightly increased, but with the increased facilities which come from handling the work I do not believe he is worked any more than before, because he has worked all he could.

The CHAIRMAN. Does he work overtime?

Dr. WILEY. Yes; very often overtime, and he is always prompt and efficient. There is one new place in class 4, one new place in class 3, and one new place in class 2, due to the actual increase in the volume of work, which is difficult and quite impossible now to handle without this increase or without drawing on the general fund, and to avoid that we have made these suggestions for these three new places in the statutory roll.

Mr. LAMB. Does the increased cost of living move you somewhat in this suggestion?

Dr. WILEY. I took that into consideration—that living is not so cheap as it once was.

The CHAIRMAN. May I inquire why the new places were created in these three upper classes rather than in the lower classes?

Dr. WILEY. The object of that was to get a better class of clerks with the higher salaries. In the transfer of our clerical service to the statutory roll provided for below those who were transferred who had shown remarkable ability and proficiency would be selected to put into these three new places.

The CHAIRMAN. It has always been the custom, I believe, to transfer clerks at the same salary they were receiving under the lump sum.

Dr. WILEY. That would be done, of course; but some of these places on the statutory roll are already paying these salaries which are provided for in these new places.

The CHAIRMAN. I know that; but I wondered why, if you have had some especially proficient clerks whom you have paid under the lump fund, you could not transfer them at the same salaries.

Dr. WILEY. There was, I think, another reason, Mr. Chairman, which I think is a good one, that in putting so large a body of clerks on the statutory roll as we did, we ought to have some larger salaries at the top. We would probably have too many of them at the bottom; we would not have a sufficient inducement to the ambitious clerk to look for a promotion to a higher place unless we provided in the upper classes as we did, one in each class, a very modest one for the higher-class clerks. That was also one of the reasons for making these new positions.

The CHAIRMAN. You have transferred one clerk from a lump fund to class 4, and I take it he was already receiving \$1,800?

Dr. WILEY. \$1,800; yes. There have been no transfers made except at the salary now received.

The CHAIRMAN. And with that transfer, if this allowance is agreed to, you will have five clerks of class 4?

Dr. WILEY. Yes, sir.

The CHAIRMAN. And six clerks of class 3?

Dr. WILEY. Yes, sir.

The CHAIRMAN. And twelve clerks of class 2?

Dr. WILEY. Yes, sir.

The CHAIRMAN. And your idea in providing new places in those three classes is to have an opportunity for promotions from the lower grades?

Dr. WILEY. Or to transfer those clerks who are already receiving this sum on the lump sum, that were receiving salaries corresponding to this new place.

The CHAIRMAN. Passing, then, to the general expenses, the first paragraph provides for chemical apparatus, chemicals and supplies, repairs to apparatus, etc., the same appropriation as the current year. The next paragraph shows an apparent decrease. Is that an actual decrease?

Dr. WILEY. No; that apparent decrease is due to transfers on the statutory roll. There is an actual increase in this amount estimated for here of \$5,000. That is, although it is an apparent decrease of a little over \$2,000, there is a real increase in that estimate of \$5,000 for the general increased expenses belonging to that class.

The CHAIRMAN. Does any of that appear in the second paragraph, providing for rent, etc.?

Dr. WILEY. As far as I know there is no increase in rent over the last year. It is more to be spent under the first head, in the general investigation of those problems relating to the application of chemistry to agriculture in the general and comprehensive sense of that term, and there will be no increase, so far as I know, for rent over what we have for the present year. Our rents are expensive because of the price we pay for fireproof laboratories, which is a good insur-

ance, however, because with perhaps pretty close to \$200,000 worth of valuable apparatus which we used to have in a building subject to fire, we have it absolutely insured now against destruction by having moved into a fireproof laboratory.

The CHAIRMAN. Is your entire bureau now in this new building?

Dr. WILEY. All but two storehouses adjoining that are not fireproof. They contain only cheaper forms of apparatus, like glass, etc., that would not be costly.

The CHAIRMAN. Why is it necessary to have stock of that kind stored in quantity? Can you not go out in the market and get it any day you want it?

Dr. WILEY. In buying, we buy in certain quantities, and the larger the quantity the lower its price. Then we have, altogether, twenty-three or twenty-four laboratories to supply; the general stocks are all deposited at Washington, and the supplies for the various laboratories are boxed and sent from Washington to the other laboratories as they need them. They have no storage room, and we can only send the material out as they need it. We must have the materials on hand in order to avoid delays and get cheaper rates.

The CHAIRMAN. Passing to the next paragraph, there appears to be a slight reduction, but I presume that is only apparent.

Dr. WILEY. There is an increase there of \$60,000.

The CHAIRMAN. I mean on page 54, the last paragraph there, for investigating the character of the chemical and physical tests which are applied to American food products in foreign countries, etc.

Dr. WILEY. \$4,280. I think that is due to the transfer, perhaps, of laboratory helpers, or something of that kind, to the statutory roll. That is an apparent decrease.

The CHAIRMAN. Since you have transferred to the statutory roll all your clerks and other employees and assistants who are not scientific experts, would it be proper or possible to eliminate the word "clerks" from your appropriation, or may it become necessary for you to employ a clerk and pay him out of this fund?

Dr. WILEY. It might be possible, Mr. Chairman, very likely and probable, that during the year it might be necessary somewhere to employ a clerk, temporarily at least; or the work might be so increased that it might be necessary to employ one permanently, and then estimate for it next year in the statutory roll. I do not think that if the word "clerk" is left in it would be abused, and it might avoid an unpleasant situation, where we could temporarily or permanently employ a clerk more than those who are now employed.

The CHAIRMAN. It has always been the practice in the Department of Agriculture, has it not, to transfer to the statutory rolls any clerks employed in various bureaus who had been on the rolls for a year or more?

Dr. WILEY. I could not say about the whole department. I know that we have estimated from time to time those who are permanent to be transferred to the statutory roll in the Bureau of Chemistry. How much farther it goes than that I do not know; that has been our policy.

The CHAIRMAN. I think that has been done, has it not, Mr. Zappone, at the request of the committee, for several years past?

Mr. ZAPPONE. That has been the custom. At the end of each year, when we make up the estimates, we transfer all the clerks who have been employed temporarily during the preceding year, and whom it is intended to continue permanently.

The CHAIRMAN. That was done originally, I believe, at the request of this committee?

Mr. ZAPPONE. At the request of this committee.

The CHAIRMAN. Passing to page 55, I notice you change the language of the first paragraph slightly. Have you any particular reason for that?

Dr. WILEY. Mr. Chairman, I did not make the change, so I do not know what the particular reason was. There is no objection to it from my point of view, as the language stands. Of course, all this work is done directly by the Secretary of Agriculture. I notice that in the other bureaus, as far as I could see, the term "Secretary of Agriculture" was not inserted, but of course he has the same authority whether it is inserted or not. Everything is done by his order and under his supervision.

The CHAIRMAN. Mr. Zappone, will you just explain that?

Mr. ZAPPONE. The change was directed by the Secretary, as he desired to have it read identically like the present food and drugs act. The wording has remained practically the same and his object, as I understand it, in breaking it up into paragraphs was to differentiate between the chemical work and the food and drugs work. The provisions for the general chemical work were not divided into paragraphs, as we have them here, Dr. Wiley. In that respect you doubtless remember that the general expense language for your bureau was different from that of any other bureau, and it was felt that we had better break it up into paragraphs and show the subdivisions just as they are shown for the other bureaus of the department. This, as I understand it, is in accordance with the wishes of this committee.

The CHAIRMAN. That is a small matter anyway, and I merely wanted to have a word of explanation in reference to it. The other new language, "and all other expenses," is made necessary by the change made in the first line, and the whole is merely verbal and does not involve any change in the work of the bureau. As to the amount there it appears to be reduced somewhat, but that reduction is probably apparent rather than real, is it not?

Dr. WILEY. There is not only not a reduction, although there is an apparent reduction due to the transfer of those mentioned to the statutory roll, but the actual amount has been increased \$60,000; that is, \$60,000 of the amount saved in transferring to the statutory roll has been added to the lump sum fund, although that does not bring it up to the amount it was before.

The CHAIRMAN. I notice that the change is pretty clearly explained in the note.

Dr. WILEY. Yes; the note at the bottom of that page.

The CHAIRMAN. The actual increase is \$60,000?

Dr. WILEY. Yes, sir.

The CHAIRMAN. I presume you asked for that in order to extend the work of the pure food inspection?

Dr. WILEY. Yes; and to provide against the contingency of a deficiency due to any unexpected drain upon the Bureau of Chem-

istry in regard to the proceedings in courts. That is a thing we can not foresee.

The CHAIRMAN. It was that unexpected contingency that involved the deficiency last year, I believe?

Dr. WILEY. Yes; that involved our coming back to you to get the money we are now asking for. Of course, we will not figure to spend all the money in our estimate. We will save this balance for a safety fund. As it is now we are holding back a lot of necessary work in order that we may save a fund for some contingency which we do not know will come, but which may come any day.

The CHAIRMAN. I understand that all the clerks, both in Washington and out of Washington, who were paid from the funds provided in this paragraph, have now been transferred to the statutory roll?

Dr. WILEY. Every one of them, and all the inspectors and all the laboratory helpers who are semiscientific, but we thought it best to put them all on the statutory roll.

The CHAIRMAN. Have you anything you would like particularly to call to the attention of the committee in relation to your work under this paragraph?

Dr. WILEY. I prepared a little statement for each branch of the work, Mr. Chairman, and have got certain samples here to illustrate it. It will take some time of the committee, and if they would rather not hear it I will let it go.

The CHAIRMAN. Suppose, since we have started upon the bill, we complete that, and then we will take up the statements. Pass then to the next paragraph, which all seems to be new language:

That the act of June thirtieth, nineteen hundred and six, entitled "An act for preventing the manufacture, sale, or transportation of adulterated, or misbranded, or poisonous, or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes," be amended so as to give to the drugs and preparations, and the tests thereof, recognized and laid down in the Homeopathic Pharmacopœia of the United States the same recognition as is given in that act to those of the United States Pharmacopœia and the National Formulary.

Will you just let us have a word of explanation on that? Have you anything to add to the note that appears below?

Dr. WILEY. I would like to answer it, Mr. Chairman, just in the way of calling your attention to this proposed legislation, which, to my mind, is a somewhat serious matter, not that I have any prejudice at all against the homeopathic profession; I affiliate with them and attend their meetings, although I do not belong to that school; but we are perfectly harmonious in our views about most things. I want to call your attention to one important thing. There are a great many drugs which are mentioned in the Pharmacopœia of the United States—which is not a sect book, nor has any relation to any medical school or medical system—there are a great many drugs mentioned in that, which have standards in the United States Pharmacopœia, which are mentioned in the various pharmacopœias of the homeopathic profession with entirely different standards. If you come to a court on a case of this kind, what is going to happen, with two standards for the same substance; just as if you were selling a piece of goods and you had a yard stick which was general, and some particular branch of merchandise had a yard stick of their own, and you would put in both yard sticks as legal? In my opinion that is going to cause untold confusion. If I were to be permitted to make

a suggestion, which would be to amend that article, it would be that all drugs not mentioned in the United States Pharmacopœia, and which are contained in the Homeopathic Pharmacopœia, shall be judged by the standard which they have in their pharmacopœia. That would avoid all confusion, and would give them the standardization of their own particular drugs, and would relieve the administration of the law of a problem which seems to be insuperable. I would like to incorporate in the minutes a statement regarding this matter that has been prepared by one of my assistants.

IN REGARD TO THE HOMEOPATHIC PHARMACOPŒIAS AND THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

The United States Homeopathic Pharmacopœia.—It appears that the only edition of this book is published by Duncan Bros., Chicago, 1878—copyrighted by Duncan Bros., 1878. This is a private enterprise and has no official standing whatever. Its standards are so low and inefficient that the crudest and in many cases greatly adulterated drugs can be sold under the names recognized by this pharmacopœia. The formula given for a number of specific compounds contained in this book are erroneous.

The American Homeopathic Pharmacopœia.—A number of editions of this pharmacopœia have been published. The last (eighth edition) is published by Boericke & Tafel, Philadelphia, Pa., 1906—copyrighted by Boericke & Tafel, 1904. This publication is a private enterprise and has no official standing. The standards are an improvement over the United States Homeopathic Pharmacopœia, but for many important drugs the standards are virtually nil and each could be sold to comply with the specifications of this pharmacopœia, and yet each product would be absolutely unreliable as regards strength, quality, and purity.

The Pharmacopœia of the American Institute of Homeopathy.—Published for the committee on pharmacopœia of the American Institute of Homeopathy, Otis Clapp & Son, agents, Boston—copyrighted 1897 by committee on pharmacopœia of the American Institute of Homeopathy. As indicated above, this publication is not a private enterprise. The standards are improvements over the United States Homeopathic Pharmacopœia, but in many of the most important drugs the specifications are deficient and entirely inadequate to insure the quality of drug that could be relied upon.

The Pharmacopœia of the United States of America (eighth decennial revision).—By authority of the United States Pharmacopœial Convention, held in Washington in 1900. The first edition of this book was published in 1820 and other editions have come out approximately every 10 years since the first edition was published. This book is revised by the committee on revision, which consists of a large number of especially trained men taken from the medical and pharmaceutical professions. The members of the revision committee are selected from various institutions and associations throughout the United States, which work along medical and pharmaceutical lines. The book is published by the board of trustees. The specifications for the large number of drugs recognized in this pharmacopœia have been arrived at after many years of painstaking investigation so that the standards of strength, quality, and purity of virtually all drugs recognized in this book are such that a reliable product may be secured.

Upon going into the subject of the various homeopathic pharmacopœias it is found that there is no agreement among them as to what constitutes a proper standard for the manufacture, dispensing, and distribution of homeopathic remedies. There are certain parties in the eastern section of the United States who at present are manufacturing and dispensing these remedies by one system and other parties in the western section of the United States who use an entirely different basis for the manufacture and dispensing of homeopathic remedies. There are a great many drugs which are recognized and contained in all four of the pharmacopœias referred to above. The following are a few of the important drugs which are recognized in all of the pharmacopœias and the examples serve to illustrate the manner in which the standards and specifications differ for the drug cited below:

Opium.—The three homeopathic pharmacopœias mentioned above give more or less of a description of the gum, but make no specifications regarding the quantity of morphine that should be contained in the product.

The United States Pharmacopœia specifies that gum opium shall contain not less than 9 per cent of crystallized morphine when assayed by a detailed process given in this book, and that powdered opium, deodorized opium, and granulated opium shall yield

not less than 12 per cent nor more than 12½ per cent of crystallized morphine when assayed according to the method given under opium.

Nux vomica.—The three homeopathic pharmacopœias referred to give more or less a description of the plant and seeds, and all state that the seed is to be employed.

The United States Pharmacopœia prescribes also that the seed be employed, and states that they should yield, when assayed by detailed process given, not less than 1.25 per cent of strychnine.

Cinchona bark.—The three homeopathic pharmacopœias give more or less description of cinchona bark and the trees from which it is obtained. There is no specifications as to the quantity of cinchona alkaloids that should be contained in cinchona bark, while the United States Pharmacopœia specifies that certain cinchona barks, cinchona ledgeriana, cinchona calisaya, cinchona officianallis, and all hybrids of these, with other species of cinchona, should yield not less than 5 per cent of total anhydrous cinchona alkaloids, and at least 4 per cent of anhydrous soluble alkaloids when assayed by detailed process given, and that the red cinchona or its hybrids should yield not less than 5 per cent of anhydrous cinchona alkaloids when assayed by the process given under cinchona.

The CHAIRMAN. I would take it from what you say that this paragraph was not inserted on your recommendation.

Dr. WILEY. No; I did not recommend it.

Mr. LAMB. The allopathic doctors would put in a protest to this, would they not?

Dr. WILEY. I do not know whether they would or not. I do not think they care much about it, because as far as the practice of medicine is concerned they do not care about the standards of the law as long as they get their own pharmacopœial standards. Many an allopathic physician prescribes homeopathic remedies, and many a homeopathic physician prescribes the remedies of the pharmacopœia. The homeopathic profession constantly prescribes drugs in the United States Pharmacopœia.

Mr. LAMB. In view of that, what is the necessity for this law, then?

Dr. WILEY. I do not know any necessity for it at all, as far as that is concerned.

The CHAIRMAN. Suppose we ask Mr. Zappone to let us have the history of this.

Mr. ZAPPONE. The provision was inserted by the direction of the Secretary, and the material was prepared by the solicitor of the department. Outside of that I am not prepared to pass on it, as I am unfamiliar with the reason for it. No doubt when the Secretary is before you he will explain that.

Dr. WILEY. Mr. Chairman, since I find this paragraph had been recommended by the Secretary, it would not be proper for me to oppose it. If you can adopt it without confusion, I have no objection to it at all.

The CHAIRMAN. I understand your point, Dr. Wiley. You suggest that if it could be modified so as to provide that whenever any preparation is not mentioned in the United States Pharmacopœia or the National Formulary and is mentioned in the Homeopathic Pharmacopœia, that the standard established in the last-named authority might be recognized?

Dr. WILEY. Yes; that would be perfectly satisfactory. I have in mind six drugs that are very common and used by all physicians—as an illustration, aconite, alcohol, belladonna, castor oil, ipecac, and nux vomica. Those are remedies prescribed by both the regular profession and the homeopathic profession continually, and they are standard drugs of the drug stores.

Mr. STANLEY. They still prescribe alcohol, notwithstanding the late prohibition agitation?

Dr. WILEY. I believe they do, occasionally. Suppose we bring a case against, say, tincture of nux vomica, and we claim it is not up to the standard of the United States Pharmacopœia. But suppose it is up to the standard of the Homeopathic Pharmacopœia. There is so little nux vomica in the Homeopathic Pharmacopœia that no chemist can determine it; you can not find it, and this substance might not have a trace of nux vomica in it, and yet be standard under the law. If you adopt both standards, it would be standard under one branch, at least, and you could not secure in the drug stores of this country a standard tincture of nux vomica that really contained the nux vomica.

The CHAIRMAN. Are the standards in the United States Pharmacopœia and the National Formulary uniform in all cases?

Dr. WILEY. Oh, no; there is nothing in the National Formulary that is in the pharmacopœia at all. The pharmacopœia is a book of drugs by itself; the National Formulary has in it the drugs that are not contained in the pharmacopœia that are in common use.

The CHAIRMAN. So there is no conflict between those?

Dr. WILEY. None whatever.

Mr. HAWLEY. I see in the note that the homeopathic preparations are made apparently from the fresh plants or leaves, and the allopathic preparations from the dried plants or leaves. What difference does it make?

Dr. WILEY. In the fresh plants, of course, there is a great deal of water, and if you would take 100 grams of the fresh plants and make a decoction, and then 100 grams of the dried plants and make a decoction, the dried plants would have from five to eight times the strength. The decoction made from a given weight of a plant in the green state is just that much less strong, that is all.

Mr. HAWLEY. But it could be, by some process of evaporation, or some similar process, made as strong from fresh leaves?

Dr. WILEY. Oh, yes, if you would take enough of the fresh plant, but it would be very difficult to get the water out of it. If the active constituents were not volatile, it would be easily done by evaporation.

The CHAIRMAN. We would like to have Dr. Wiley take up the different branches of the work, as he suggested a moment ago.

Dr. WILEY. I will do that very briefly, Mr. Chairman, and show you a few illustrations of the work we are doing. I will take up first what we call our contracts laboratory. To make it compact, I will just read a little paragraph I have here, instead of trying to speak it from memory:

Tests and examination of contract supplies furnished by contractors to this and other departments of the Government; study of method of testing supplies and the preparation of specifications for contract supplies. The testing of supplies for the Isthmian Canal Commission is especially large. Study of the inflammability of denatured alcohol and the methods for the storage of the same; examination of linseed oil; study of the service of paint and paint materials.

CONTRACTS LABORATORY.

1. EXTENSION OF THE WORK ON TESTING PAINTS AND PAINT MATERIALS.

It is proposed to prepare an extensive series of paint exposures in order to study the working qualities of different types of paints as actually exposed to the weather. This will be carried on in cooperation with other branches of the Government service interested in the matter.

II. THE STUDY OF THE DIFFERENT BRANDS OF ENAMEL COOKING UTENSILS.

This study will be made with a view to ascertain, first, if they give up any injurious substances to food prepared in them, and secondly, to devise methods of testing the durability of ware of this kind.

These are things we do for the Government at large and for our own department. The work for the canal commission has resulted in the saving of many hundreds of thousands of dollars to the commission, I am sure, and promoted very materially the progress of the work.

The CHAIRMAN. Can you just give us one case that will illustrate what you have done for the canal commission?

Dr. WILEY. Yes; I have it right here. I have brought it along to show you, where we have saved them from investing in a great many worthless materials. Here is a sample. I will read the label:

Contract No. 10780. Submitted by the Isthmian Canal Commission. Material, white baggage-car enamel. There was no specification for this material and no statement other than that it was white baggage-car enamel.

The examination indicated that the pigment is mainly lithopone, a pigment which is not adapted to outdoor exposure, but might give good service for indoor use. The analysis also shows that the volatile portion of the vehicle is in part turpentine substitute. The painted panel shows that the material gives a very good coat on wood. It should, however, be a cheap product and should not be used except for indoor exposure.

We made that report, as there was no specification for this material, to the commission, and left them to use their own judgment in regard to the matter.

Here is a portion of this enamel which we made a sample of and transmitted to the commission.

Here is one where we recommended a rejection altogether of the sample. So they did not buy that.

Here is another one:

Contract No. 10510. Submitted by the Isthmian Canal Commission: Material, carriage finishing varnish. No specification.

The examination indicates that this is not a high grade of carriage finishing varnish. It contains rosin, and the fact that the film turns white on exposure to water is highly objectionable.

We transmitted that. We, I suppose, examine on an average four or five samples a day of all kinds of materials, and they buy or refuse to buy on our reports. In that way they get always a high grade of material for everything which they use. That is enough for that.

Mr. COCKS. Does not almost all varnish turn white when water gets on it, a varnished surface?

Dr. WILEY. No; a high-grade varnish suitable for exposure to the weather will not.

Mr. COCKS. I notice it said that it turned white when water was put on it.

Dr. WILEY. Then the examination of our own supplies saves us a large amount of money and increases our efficiency. For instance, there was an order of platinum which we bought on specifications. We use, of course, in chemistry, a great deal of platinum ware. This was an order of about \$3,000 worth of platinum on contract, and we submitted it to the test to which platinum should be sub-

mitted, and we found it was adulterated with iron—just a little, but enough to ruin it for our purposes—so that when we blasted it a brown film would come out, making it totally useless for chemical work. That we turned back and saved ourselves that \$3,000 in bad platinum and the use of material that might have vitiated our work. It would not have appeared in an ordinary test at all.

The next special work we come to is the work we are doing in leather and paper, and I think that is a very important work. Already the Government is beginning to use the results of this work for getting a cheaper and better article of paper and one that will go at about half the postage that many public documents are going at now. That is something to be saved in postage. Papers that are made to-day, the ordinary cheap papers which the Government buys for its ordinary publications, are frequently weighted papers. A lot of material is incorporated with them solely for the purpose of giving weight, sometimes 15, 20, 25, and even 40 per cent, and they are made thicker and heavier than they should be. We have some very good illustrations here of that.

Mr. HAWLEY. How are they weighted?

Dr. WILEY. With barytes and heavy material of that kind, gypsum, and especially china clay.

Mr. HAWLEY. Ground in.

Dr. WILEY. Ground in with the pulp. Here are a lot of envelopes that the post office would not send out. They fell to pieces going from the Department of Agriculture to the Post Office Department, and the post office sent them back and said they could not send public documents in rotten stuff like that.

The CHAIRMAN. How did you happen to get that "rotten stuff?"

Dr. WILEY. It was made of improper material and was old stock, probably purchased before the inspection of our supplies was as general as it is now. Here is the paper that we made in our own laboratory in a small way from cornstalks, an excellent paper. In the South they are breaking up the old pine trees that are blown down and distilling them to make turpentine out of them. You can make charcoal out of the residue; but we took the chips and made one of the best kinds of wrapping papers we have seen in a long time, out of the chips; and paper materials are getting scarce in this country.

The CHAIRMAN. Are they distilling turpentine from wood in a commercial way now?

Dr. WILEY. Yes, sir; a very large quantity of turpentine is made that way.

The CHAIRMAN. There are large and successful factories, are there?

Dr. WILEY. Yes, sir.

The CHAIRMAN. You say that the pulp which is left after the process of distillation can be used in making a good quality of wrapping paper?

Dr. WILEY. A most excellent quality of wrapping paper; that is it.

The CHAIRMAN. Are the turpentine distilleries disposing of their residuum in that way?

Dr. WILEY. They burn it, throw it away as a rule; they do not make any use of it except to feed their furnaces, or throw it away, that is all. There is the best illustration of all. There is the same bulletin printed on the paper we recommend, and printed on the ordinary paper. The latter would cost twice the postage and last

half as long, and the cost of this good paper is no more than the cost, not much more, than the cost of the poor paper, and when you consider the weight and the saving in postage and the storage room, it is far cheaper.

The CHAIRMAN. What makes the difference in the cost?

Dr. WILEY. This is a little better grade of paper. There is no weight in it at all. It is a little thin, but has to be made of a better pulp.

The CHAIRMAN. I thought you said the paper you recommended cost less than the other?

Dr. WILEY. It costs less if you take into consideration everything in connection with the printing and distribution of it. That is the best object lesson. The Department of Agriculture, I was told to-day, has decided to print a number of these bulletins on this paper for economical purposes, as well as for lasting qualities.

The CHAIRMAN. I notice you have some paper which you say was made from the turpentine waste and other materials.

Dr. WILEY. And other made from cornstalk.

The CHAIRMAN. I presume, of course, you know of the work that is being done by the Bureau of Plant Industry?

Dr. WILEY. Yes, we are collaborating with the Bureau of Plant Industry, doing the chemical work, suggesting the chemical processes. But in order to test our own processes, we have a machine, a simple apparatus, to show the effect of the treatment on the finished paper.

You gentlemen from the South know about the rosin business, and how rosin is sold on sample.

Mr. STANLEY. Doctor, before you get off the paper proposition, let me ask you if you have discovered any fiber that, taking it all in all—the ease with which it can be assembled, the cheapness of it, the enormous quantities annually produced and that is accessible all over the country—is it in any way superior to cornstalk fiber, when you take into consideration the different kinds of paper you can make out of it?

Dr. WILEY. The thing we have to overcome in making fine paper from the cornstalk fiber is the node—the joint.

Mr. STANLEY. Yes.

Dr. WILEY. We have not yet devised any means of handling that economically, so as to make cornstalk paper cheaply, though a very fair white paper can be made without removing the joint. If it were not for that joint in the cornstalk there would be no difficulty at all about it. But so far the cost of beating that joint to a fine pulp is too great, and we have not devised a satisfactory chemical means to do it.

Mr. STANLEY. How about some machine to take that joint out?

Dr. WILEY. Or else some machine to cut it out, which would be rather difficult.

Mr. RUCKER. Do you consider that cornstalk paper a good paper?

Dr. WILEY. Yes; that is a good paper.

Mr. RUCKER. It seems to be very easily torn.

Dr. WILEY. Of course, it is not calendered, or anything of the kind. It is nothing but dry pulp.

Mr. RUCKER. That is not finished, then?

Dr. WILEY. No; that is not finished paper. It is simply dry paper pulp.

Mr. RUCKER. It could be made stronger, could it?

Dr. WILEY. Oh, yes; it could be made stronger.

Mr. STANLEY. They make paper out of cornstalks that you can make a box out of, and lay it in water for three days and take it out, and it will be as firm as ever. That is a fact.

Dr. WILEY. Coming down to the matter of rosin: All the rosin of the country is sold on samples prepared from little cubes cut by one firm in New York. These cubes vary in size and shape to such an extent that it is estimated that if they had a uniform testing of rosin it would be worth many hundreds of thousands of dollars to the trade. We have devised in our bureau two uniform methods of standardizing rosin. One is a cylindrical testing-machine, which is the easiest mode, because it is absolutely uniform. The other is a molded one, which makes every one of the pieces of exactly the same size.

When rosin is bought they cut out of the barrel a piece of this size [indicating] and hold it up with one of the tests to match it; and the grade is made on that test. A difference of one grade lower makes a difference of 30 or 40 cents a barrel on the price of the rosin. Naturally the man that buys it wants to put it down as low as he can, and the man that sells it wants it high; and so they make this ununiform. One man may have a piece of one size, and another of another. Those are the standards which they use now. These are the standards which we propose. They are perfectly uniform and could be introduced into the business very easily.

The CHAIRMAN. Who provides the standards that are now in use?

Dr. WILEY. The name is found there on the writing which I have transmitted with this, which can be made a part of the record. I have forgotten the name.

Mr. LEVER. Hiram F. Smith & Sons.

Dr. WILEY. Yes; that is the name.

Mr. STANLEY. Doctor, excuse me for asking the question, but I do not understand the object of having all the pieces of rosin the same size.

Dr. WILEY. Because when you want to standardize them for color and quality you look through them. If, instead of an independent firm that has no legal obligation, the Department of Agriculture were authorized to make these cubes, the trade would gladly accept a standard of that kind; and it would save the trade a great deal of bickering and lawsuits, and put it on a much better basis.

Mr. COCKS. What kind of paper is this? This is wood-pulp paper, is it? I refer to this thin book.

Dr. WILEY. Yes; it is a pulp paper, the same as the other, made of a finer grade, and it costs only half as much to distribute it.

The CHAIRMAN. Is it your idea that the department should be authorized to make up sets of samples of rosin and send them out to the commercial centers, just as the Bureau of Plant Industry is making up sets of cotton samples?

Dr. WILEY. I think so.

The CHAIRMAN. In order to standardize them?

Dr. WILEY. Yes; and the trade would come to it without any law. They would all be glad to get a standard sample which they could rely upon. It would hardly take an act of Congress. If the Secretary of Agriculture were authorized to make these samples and let anybody use them who wanted to, the trade would come right to it

and pay the price. It would not cost much. Probably it would not cost over a dollar or a dollar and a half to make a set of samples, and they would be glad to pay the expense of it.

I have some other things here. Paper is not the only thing, gentlemen, that is loaded. Leather, and especially sole leather (which ought not to be), is loaded. Here are samples of loaded and unloaded leathers which I will pass around. You can look at them at your leisure.

Mr. LEE. Which is the loaded leather? How do you tell them apart?

Dr. WILEY. They are all labeled. Glucose is one of the things used in loading leather. It is a simple fraud. It just adds to the weight of it; and of course when you go out into the wet and snow the glucose, which is soluble, runs out and water runs into its place.

Mr. STANLEY. How would you remedy that, Doctor? Would you put it under the pure-food act and forbid the loading of leather, or provide against it in some other way?

Dr. WILEY. There ought to be some statute law—even the common law would do that—to prevent it; because it is practiced to an immense extent, and to the great detriment to the lower quality of shoes.

Mr. RUCKER. It is all loaded, is it not? Has not all that got glucose in it?

Dr. WILEY. Some of the samples, I think, are unloaded.

Mr. LEE. They do that to give it weight? Is that the idea?

Dr. WILEY. Yes, sir; it is sold by the pound, you know.

Mr. LEE. The tanners do it?

Dr. WILEY. Yes; the tanners do it. It is sold by the pound.

We have carried on for a number of years an interesting line of experiments, which is now being copied in other countries. I got just to-day a bulletin from Australia, where our methods of investigation have been applied to find out the effect of environment upon the chemical composition of plants. The plant being a chemical unit, and nature being the laboratory, it follows that every variation in the plant is due to some chemical change. You bite into an apple, and you say it is good. You bite into another apple, and you say it is bad. The difference is conditioned solely by its chemical constitution, if we can find out what that is.

This work was first done in the sugar beet, as you know. It resulted in the mapping out in this country, after 15 years of careful investigation, of a region which we proclaimed suitable to the growth of sugar beets with the highest possible content of sugar. It is interesting to know that every successful beet-sugar factory in the United States has finally been located in that belt. All that tried to go outside of it failed, and all the successful ones are in that belt.

At the same time, about 10 or 12 years ago, I started a similar investigation on wheat. Afterwards I turned it over to Mr. Le Clerc, in my bureau. He has continued these investigations on wheat; and I wish to show you here a most interesting example.

The CHAIRMAN. While you are waiting for that sample, can you tell us whether there is any chemical examination that will determine the flavor of an apple—what it is that gives it its flavor?

Dr. WILEY. Yes, sir. The flavor of every apple is determined by chemical constituents—compound and simple ethers. They can be

isolated and imitated. I got a letter yesterday from a gentleman who is coming over to show me how to introduce artificial flavors into fruits.

The CHAIRMAN. Do you think it would be possible, by collaboration between the Bureau of Chemistry and the Bureau of Plant Industry, to breed the flavor of the winesap into the stock of a Ben Davis?

Dr. WILEY. It would be a great improvement to the Ben Davis if we could.

The CHAIRMAN. That is the reason I inquired.

Mr. COCKS. Could you make a Pacific coast apple taste as good as a New York State apple?

Dr. WILEY. That is just what the environment does. We can not do it, but nature can.

Mr. McLAUGHLIN. Does your examination determine what quality in the soil contributes the flavor to the apple?

Dr. WILEY. The soil has its share, but it is a very modest share.

Mr. McLAUGHLIN. Is it the atmosphere?

Dr. WILEY. It is the distribution of the heat, the sunshine, the amount and direction of exposure to the sun's rays, the protection against bad winds, and everything of that kind. All of those things are most interesting to study.

The CHAIRMAN. And yet back of it all there must be a fundamental difference. Otherwise, if you planted a Ben Davis and a Winesap side by side, so that all the conditions of temperature and sunshine and exposure and moisture would be identical, the two fruits would be the same.

Dr. WILEY. Oh, no; because you must not forget the persistent and everlasting impulse of nature's original germ.

The CHAIRMAN. That is what I say; you can not account for it altogether by conditions.

Dr. WILEY. Oh, no; our work is only to modify that original impulse—not to try to transmit it into something else. But you can take an apple and grow it in one locality, and take the same apple and grow it in another locality, and have a distinct difference in flavor. We want to discover what that is due to, so as to avoid making that mistake.

Mr. HAWLEY. Can you add to the soil certain constituents that will change the flavor of the apple?

Dr. WILEY. I do not believe you can. The soil is the controlling factor (other things being equal so far as heat, light, and water are concerned), the soil is the controlling factor in the production, whether it is a big crop or a little crop. A big yield is found in most all cases to depreciate more or less the quality of the crop. To that extent the soil does determine the quality; because the bigger the product, as a rule, the less palatable it is; and as a rule the smaller the product, the more palatable it is. Nature seem to have a certain amount of palatability which she distributes equally.

Mr. HAWLEY. Do you mean the size of the apple, or the quantity on the tree?

Mr. WILEY. The size and the quantity on the tree. Some apples are naturally large, and some small.

Mr. McLAUGHLIN. Then in an orchard where the soil is exactly the same over the entire area, but there is a different lay of the land, where the air currents will be different and the sun's rays different—

Dr. WILEY. And the drainage different.

Mr. McLAUGHLIN. And the drainage different—

Dr. WILEY. You would have differences in quality, undoubtedly. We started on wheat many years ago.

Mr. HOWELL. To what extent does irrigation affect the quality?

Dr. WILEY. Of course the distribution of water is a dominant factor in the crop. You can not grow a crop without a proper distribution of water. You can injure a crop in quality, though, by using too much water. It will not have the same quality if it has too much water that it would have with a less amount.

We commenced this experiment in 1905 with a sample of wheat which we planted in Kansas; and the seed with which we have subsequently practiced came from that seed. Our object was to see what effect difference of locality would have upon the protein content of the wheat—the gluten, you might say. This Kansas wheat had 16.2 per cent of protein. That is a very large percentage. We planted that seed in three widely-separated localities, viz: Kansas, again, and California, and Texas. These are the products made from this seed in the next year, 1906. [Producing samples.] Planted in Kansas, it increased its protein to 19.1 per cent. Planted in California, the protein fell to 10.4 per cent—just a little over half. In Texas it was 12.1 per cent.

Mr. HAWLEY. Were the cultural methods the same in all cases?

Dr. WILEY. Yes; the cultural methods were the same, but we could not control the climatic conditions.

Mr. HAWLEY. Would it have made any difference in the quantity of protein? Would the cultural methods have made any difference in that?

Dr. WILEY. I do not think so. They would have made a difference only in the total amount, not in the percentage.

We took this Kansas wheat and planted it again in Kansas, and we planted this Kansas wheat in California, and we planted this Kansas wheat in Texas. We took the California wheat and planted it again in California, we planted it in Kansas, and we planted it in Texas. We took the Texas wheat and planted it again in Texas, we planted it in Kansas, and we planted it in California. We got that crop there in 1907.

Then we took all three of those—that with the low content of protein, and this with the low content of protein, and this with the high content of protein—and took them back to Kansas, and all of them increased in protein. It went up to 22.2, 22.8, 22.4—no difference. Although the seed was so different in its content, the resultant crops were all alike. In California they were all low—11, 11.3, 11.4. In Texas they were higher than they were before, but uniform, and lower than in Kansas—17, 18, and 18.

Unfortunately, not through our fault but through the mistake of our collaborators, the Bureau of Plant Industry (I do not say this critically, however), we lost our Texas crop for 1908, so we can only give the others. This, again, is the straight Kansas wheat. This is the Kansas wheat planted in Texas, and so on through, just changing them back, getting the seed back again to each place. In Kansas in

1908 we had an entirely different condition of environment from 1907, 1906, and 1905. In 1908 Kansas was a low-protein State, due to the character of the climate, undoubtedly, because it was an exceptionally wet year for that region.

The CHAIRMAN. It was due to the particular season?

Dr. WILEY. Yes. It fell to 14.7 and 14.8. California still maintained its constancy—11.5, 12, and 12.4. Texas we did not get.

We take with this the whole record of the climate. We can get the record every day from the nearest station of the Weather Bureau; we know the exact sunlight and the exact amount of heat which each one of these received, and the amount of rainfall, or of irrigation, if they were irrigated. Then we go to work (as we did in the case of the sugar beet) and try to find out the factors that produced this high protein.

Mr. STANLEY. Does it make any difference in the price of the wheat?

Dr. WILEY. Yes; it is a higher priced wheat. A hard wheat, with a large content of protein, is the highest priced wheat on the market.

Mr. LAMB. How much did you sow at each place to get those samples?

Dr. WILEY. Oh, just small patches; probably from a twentieth to a tenth of an acre.

Mr. LEE. Is this winter wheat?

Dr. WILEY. Winter wheat; yes.

The CHAIRMAN. Have you made any deductions from those experiments?

Dr. WILEY. No; nothing final, for it takes more years than this. We have, however, published Bulletin 128, which gives the results of these experiments on wheat.

The CHAIRMAN. What is the maximum content of protein in wheat?

Dr. WILEY. I rarely have seen it higher than this one that was put in here at 22. That is about the highest it ever runs.

Mr. HAWLEY. Of what variety is the wheat?

Dr. WILEY. Crimean.

The CHAIRMAN. Do you consider it at all remarkable that wheat which was grown in California and showed a protein content of only about 11 per cent, when returned to Kansas made just as much protein as the seed which itself contained 22?

Dr. WILEY. It is a little bit contrary to the ordinary doctrine of propagation and improvement; but, remember, it is the same wheat. It came back home; that is all. An absence of one or two years had not changed its nature. Even by growing it continuously in California for 15 or 20 years, or 50 or 60 years, you probably could not change it so that it would not do that when it came back to Kansas. The tendency would be to bring it back, because the cultural conditions in Kansas are favorable to the production of wheat with a large amount of protein. My deductions were, after four or five years' work on this matter itself, that the more rapidly the wheat grew, the shorter the time from planting to harvest, the higher was the content of gluten.

Mr. HAWLEY. Dr. Wiley, might it not be possible that the wheat that was taken back to Kansas, and from which you obtained a higher

protein content, had been in a place where it was grown before and crossed with some variety of wheat having naturally a higher protein content?

Dr. WILEY. That may have been in the original seed; but this seed has not been crossed with anything since we got it. It has been kept by itself.

Mr. HAWLEY. It might have been crossed, in the processes of nature, from nearby fields.

Dr. WILEY. The point which I want to accentuate with this is that you must have recourse to chemical control in order to get the full benefit of plant breeding. In this we are working with the Bureau of Plant Industry. The mere appearance of a plant, or the appearance of a grain, while it is indicative, is not final. The actual composition of the plant must be known in order to know just what effect the environment has had upon it.

Mr. HAWLEY. There might be some varieties of wheat that had a greater protein content than the wheat you have there.

Dr. WILEY. Oh, yes.

Mr. HAWLEY. And it might be that some varieties of wheat would thrive better in Kansas, and produce a greater protein content, than other varieties.

• Dr. WILEY. Undoubtedly.

Mr. HAWLEY. It seems to me the experiment would not be complete until you had experimented with a large number of varieties.

Dr. WILEY. It would not be complete for anything but this particular variety; but it would be indicative of what was the effect of a climate, and where we should go now to grow wheat with the highest content of gluten, which is needed by a great many millers for blending and other purposes. They want a highly glutinous wheat, and they also want a starchy wheat. Of course, we knew before that these differences existed; but why is it? Why is this; and can it be changed? Can we grow a more glutinous wheat in California, and can we grow a starchier wheat in Kansas?

The CHAIRMAN. For many years it has been the practice of the big mills at Minneapolis and other milling centers to blend their Kansas wheat with wheat from other parts of the country. Did they make that blend upon the advice of chemists? If not, how did they arrive at their conclusions?

Dr. WILEY. They made that blend largely not only on the advice but on the actual demonstration of chemists. They keep chemists of their own. Suppose a new wheat is brought to a Minneapolis mill, without their knowing where it came from; but suppose the man who brings it says: "I can furnish you any quantity of this." What is the first thing they do with it? They send it right to the laboratory. They do not grind it. They want to know what it is made of, and what are the relative proportions of gluten and starch in that wheat. When they find out those things, then they are ready for the milling, and can tell how to mix it and how to blend it to make the standard flour they want.

Mr. RUCKER. That Kansas wheat, I take it, is the best wheat on the board, is it—the highest grade?

Dr. WILEY. If you judge wheat by its gluten content, yes. Of course that is not the only thing you go by.

Mr. RUCKER. That is the finest-looking specimen.

Mr. McLAUGHLIN. In which locality did you find the largest yield per acre?

Dr. WILEY. We have not that. We only determine what the effect is on the chemical composition. We have the yield per acre, but we have not got it down there.

Mr. LEVER. There seems to be a different color in those samples, Doctor.

Dr. WILEY. Yes; a harder wheat, a more glutinous wheat, has a distinctly different color. I have seen California wheat where you could almost see the starch granules through the bran, they were so starchy. But that is flinty, like a polished wheat.

We wanted to know whether or not we could get a larger yield of starch from the potato by any simple means. That is one of the things we are doing in this laboratory. If you dry a potato or any other starch-producing plant and then grind it finely, you can get from 10 to 15 per cent more starch out of it than you can if you try to treat it moist. That one little fact, which we demonstrated in those two phials, is worth a great deal of money to the starch makers of this country. We did that to ascertain if a more complete separation of the starch from the fiber could not be made.

Mr. HAWLEY. Artificially?

Dr. WILEY. Yes; they had found out by accident, I suppose, that one of those would yield a great deal more starch than the other.

Mr. LEE. Which is the wet and which is the dry?

Dr. WILEY. This paper, which came off of those, will tell.

Mr. McLAUGHLIN. How much more starch did you get from the dry potatoes than from the moist ones?

Dr. WILEY. The potato has about 80 per cent of water in it; and if you take that water out, you increase the starch content just five times, you might say—pretty close to five times. If there is 18 per cent in the moist potato, there will be pretty close to 90 per cent in the dry potato.

Mr. McLAUGHLIN. But you do not get any more out of the potato.

Mr. COCKS. That would be so in actual weight; but you do not put any starch in the potato by drying it.

Dr. WILEY. Oh, no; there is no increase at all of the starch. But you can extract it better after drying it, because the starch granules are separated then, and they will wash out with the water in the sieve. They will all wash out, and nothing but a pure fibre will be left. In the ordinary way of extracting starch, a large portion of it goes away with the fiber and never does wash out, because the cells are not broken.

Mr. COCKS. Then this amounts simply to an improvement in a method?

Dr. WILEY. Yes; simply an improvement in the method.

Just a word on another thing: We have tried to utilize the waste lemons and oranges of California and Florida as they do in Sicily. We sent into Sicily one of our men, who stayed there three months, and studied their whole process of making essential oils and other by-products out of limes and oranges and lemons. Then he went into southern California; and we are now working out a scheme by which we think all the fruit that falls, all the bad fruit that can not be shipped, can be turned into by-products with profit to the farmer.

This little squib, which I will offer for the record, is an account of that work.

(The paper submitted by Dr. Wiley is as follows:)

FOOD DIVISION (CURRENT WORK).

Study of the lemon-oil industry; investigation of the production of peanut oil; study of the varieties of the soy bean as to the production of oil therefrom and the most profitable variety, in collaboration with the Bureau of Plant Industry; examination of foods for the War Department and other departments of the Government, in collaboration with the Bureau of Plant Industry; study of the preparation and preservation of fruit and fruit juices for the market; study of new methods of analysis; study of the utilization of by-products of lemon; work on fermentation.

FOOD DIVISION.

I (in conjunction with Bureau of Plant Industry). The study of the quantity and quality of oil which can be produced from different varieties of Spanish and American peanuts and of possible uses for the oil and press cake.

II. A study of methods for the reduction of the unsaturated oils of cotton-seed stearin, with a view to increasing the hardness of the product and making it available for the preparation of a lard substitute, free from all animal products.

Dr. WILEY. In the dairy laboratory, we are continuing in collaboration with the Bureau of Animal Industry our work of controlling the butter supply. There has lately come again into vogue the old fraud of churning butter so as to hold more water; and people are going around the country to-day selling preparations and apparatus to innocent farmers who do not know that they are violating the law. They say: "I will make you 3 pounds of butter where you are making 2." They do it either by putting into the cream some drug like an enzyme, which incorporates a lot of casein and water into the butter, or by a process of churning which mechanically incorporates the water in the butter. We have been studying those methods and warning the farmers against them. Every little while somebody writes in and says: "A man was here selling me a preparation which he said would make 3 pounds of butter where I got 2;" and we are protecting the people against that. As you know, the courts have established a standard for butter—that it shall not have over 16 per cent of water; and they have sustained the regulation that if it has over that proportion, it is an adulterated article.

Mr. COCKS. Do they not sometimes throw down all the solids into it, too, Doctor?

Dr. WILEY. Yes; I mentioned that as part of the incorporation of water and casein. It makes a kind of a cheese instead of a butter, of course.

Mr. LEVER. Doctor, have you ever churned pure cream with cotton-seed oil to see what the result was?

Dr. WILEY. No; I never have.

Mr. LAMB. These oleomargarine people do that.

Mr. LEVER. No; it is not on that theory at all. There have been some experiments made down home, with the result that it seems to add about one-fourth to the value of the butter.

Mr. COCKS. To the value of the oil, you mean. [Laughter.]

Mr. LEVER. No; the value of the butter.

Mr. McLAUGHLIN. What do they call the product?

Mr. LEVER. Butter, of course. [Laughter.]

Dr. WILEY. There is an adulterated butter [producing sample]. I brought it up at random. It is one of our samples.

Mr. RUCKER. What is the adulteration? What is it adulterated with?

Dr. WILEY. Water; nothing but water.

Here is an oleomargarine colored in imitation of butter, which, I am sorry to say, the law permits, if it is tax-paid. But as long as you color butter in imitation of something else, there is not much to choose between the two processes, I think. Those are samples I took up at random.

Again, the country is flooded with these things—"Cream-thick;" you put it into milk to make it thick. These are nearly all preparations of gum tragacanth and are wholly fraudulent. The markets are being flooded with advertisements of this kind.

Mr. COCKS. How can you prosecute them, Doctor? Under what law?

Dr. WILEY. If you can apparently turn milk into cream and sell it as cream, it is a fraud.

Mr. COCKS. Yes, I know; but suppose he does not sell it? Suppose he just uses it for himself?

Dr. WILEY. That is another matter.

Mr. COCKS. You can stop the sale. What I mean is, you can not stop the sale of the drug until he offers the finished product?

Dr. WILEY. No. The farmer does not hurt himself in any way if he uses the product himself.

Mr. COCKS. Are there not other ways of making milk appear like cream, besides these things?

Dr. WILEY. There is nothing but color and thickening. There are many other reagents than that I mentioned. For instance, sucrate of lime will do it, and other things. But ordinary gum tragacanth, or something like that, is the usual one.

Mr. COCKS. I have understood that they could make what appears to be cream out of a very low grade of milk. It would be deficient in butter fat, but it would be thick, and have all the appearance of cream.

Mr. WILEY. That is a fact.

Mr. COCKS. And I understood that it was done largely through manipulation at a certain temperature; that is, that that was essential.

Dr. WILEY. The gum tragacanth ought to be warm enough to dissolve.

Mr. COCKS. I did not know about gum tragacanth. That might have been used. I thought it was only a matter of temperature.

The CHAIRMAN. If a farmer offers for sale or sells butter which contains an excess of water, may he be prosecuted under the pure-food act?

Dr. WILEY. Not unless he sells it across the State line.

The CHAIRMAN. In case he does sell it across the State line, so that it enters into interstate commerce, will he be prosecuted for selling an adulterated article, or will he merely be required to pay the tax on adulterated butter?

Dr. WILEY. It all depends on whether the suit is brought by the Treasury Department or by the Department of Agriculture. If it is brought by the Treasury Department, they will usually let him off by paying the tax. But we are not after the tax. We are after pure butter. It is very seldom that a farmer ever sells butter across a

State line. He usually sells it to a dealer, who subsells it. But if a farmer makes a butter with over 16 per cent of water, it is the result of carelessness. No well-made butter should ever have 16 per cent of water in it.

The CHAIRMAN. And the effect of having more water is that the butter spoils sooner?

Dr. WILEY. The butter spoils sooner, and the man who buys it is cheated. He is buying water and supposes he is buying butter.

There is another sample of butter that contains 24 per cent of water. That can only be done by manipulation. You can not make butter hold that much water except by special manipulation, on purpose to do it.

The CHAIRMAN. The gentleman from South Carolina said that instead of working water into their butter they work cotton-seed oil into it.

Dr. WILEY. I am sorry to hear that.

Mr. LEVER. That is not my statement, but somebody else's statement. I deny it. [Laughter.]

Dr. WILEY. I have no objection to cotton-seed oil. It is a good, wholesome food. But it ought not to be sold for olive oil, nor for butter, nor for ice cream. It was sold as ice cream at the Jamestown Exposition. I suppose Colonel Lamb knows that they sold it for ice cream; but they told you what it was. They said it was made out of cotton-seed oil, but they called it ice cream.

Mr. COCKS. How did it taste?

Dr. WILEY. It had a very good taste—very good.

Mr. COCKS. We had some very good products here last winter made out of cotton seed. Our friend from Texas brought them up here—bread, cake, etc., made out of cotton seed.

Dr. WILEY. There is another one of those cream frauds [producing sample]. There is the corpus delicti. There is the powdered gum tragacanth.

There is a sample of butter made out of whey, after the cheese has been made. It is a very low-grade article. It is butter, though; but it is not fit for consumption. It is adulterated butter, but it is made of butter fat. It is not anything but butter fat, but it has been recovered from the whey.

There is a cheese, or what was sold as cheese, made wholly out of skimmed milk. We call it an adulterated cheese, inasmuch as it is made of skimmed milk.

Mr. LEE. It has got a good color, has it not?

Dr. WILEY. Yes; but that is not nature's color, unfortunately.

Mr. COCKS. Doctor, I understand that these things are not necessarily deleterious to health—these "cream thicks," and that sort of thing. There is nothing poisonous about them?

Dr. WILEY. I do not think gum tragacanth is injurious to health. I would not want young children to eat it. It has some food value, but it is pretty hard to digest.

Mr. COCKS. What is it made of—gum arabic?

Dr. WILEY. Gum arabic is just as bad as gum tragacanth. It costs more.

Mr. COCKS. It is made from the gum of a tree, is it not?

Dr. WILEY. Yes. Gum tragacanth is a gum of its own. Mr. Emery or Mr. Hoover can state just what it is. I do not know just exactly.

Now I would like to show you something better.

Mr. COCKS. That is right.

Dr. WILEY. The Japanese persimmon is now grown very extensively in this country. When it gets ripe you can not transport it; it is so soft. It was learned that in Japan the Japanese (who seem to know more than anybody else) could ripen these persimmons, and while they would be firm and hard and transportable, they would still be ripe and sweet. We found that they ripened them in saki casks. We thought, then, that the ripening was influenced by the "demon alcohol." So we tried ripening them in alcohol vapor, but that did not seem to be of any value. One of my boys then thought that perhaps it was carbon dioxide which was present in the cask. We found that we could fill this jar full of carbon dioxide, and put those persimmons in there, and ripen them, and they would be just as hard when they were ripe as they were when they went in, and would keep hard for several days after they were taken out. These were ripened two weeks ago and have been kept in a refrigerator since.

Mr. LEE. Are they as good as if they were ripened naturally?

Dr. WILEY. Yes; they are perfectly ripe, too. The only difference is that they are firmer.

Mr. RUCKER. Where were those grown, Doctor?

Dr. WILEY. These were grown in Florida.

Mr. COCKS. How do you produce the carbon dioxide in quantities?

Dr. WILEY. Oh, you can make it from marble or limestone, or from a brewer's fermentation cask. There are springs that give it off in large quantities. It is sold very cheaply in cylinders all over the country.

We have done a great deal in a branch of science which is called enology. As you are all Greek scholars, I probably need not tell you that that is the science of treating fruit juices—in other words, wine science.

The CHAIRMAN. I am glad you gave that explanation. There is one man around the table who did not know what it meant.

Dr. WILEY. We have a laboratory at Charlottesville where for several years we have been experimenting to show the farmers how to handle cider so as to make it a profitable and palatable crop. We have developed there and distributed throughout the country hundreds and perhaps thousands of samples of yeasts of a pure culture, which, when put into sterilized apple juice, will make cider of a definite character and flavor. When you have a cider that is too hard, it is due to bad fermentation, or what we sometimes call a mal-fermentation; that is, a yeast that is a "black sheep." When you get a good cider, it is the result of a yeast with a good character. Then we have worked a great deal in making a pure sweet cider that can be used without any preservative.

Mr. STANLEY. Will it stay that way, Doctor?

Dr. WILEY. It will stay that way all winter. We do this by making it out of clean apples, in the first place. You can never make good cider out of rotten apples. Most farmers use knotty apples, worm-eaten apples, and rotten apples. That is not cider at all; it

ought never to be sold off the place. Cider which is suitable for transportation and human consumption, and worth transportation, ought to be made out of sound apples.

Here is some cider made out of sound applies and treated as we treat it at the department. It is not only pure cider, but when it is made it is run through a milk separator, which takes out every bit of yeast and every particle of foreign matter, and leaves nothing but the pure juice. This has not been very carefully kept. I brought it up a couple of days ago, and it is just beginning to get a little fermented now; but you can drink it with safety.

Mr. McLAUGHLIN. You do not mean that that is your only treatment of it?

Dr. WILEY. That is the only thing.

Mr. McLAUGHLIN. Putting it through the separator?

Dr. WILEY. That is all; nothing else. This is three or four weeks old now.

Mr. McLAUGHLIN. Do you not put some "dope" of some kind in the can?

Dr. WILEY. No, sir. You would not accuse me of that, I know.

Mr. McLAUGHLIN. I do not mean liquor; I mean some preservative or other.

The CHAIRMAN. You do not pasteurize it in any way?

Dr. WILEY. Oh, not at all. We keep it cool.

Dr. WILEY. That will keep in your cellar all the winter through, and will scarcely be hard by spring—that is, if it lasts that long. It is so good that I do not think you will let it stay that long.

Mr. McLAUGHLIN. Do we understand that if cider is made of sound apples and run through an ordinary cream separator it will be this kind of cider?

Dr. WILEY. If put in a sterilized barrel and put in a cool place, it will keep from November until the last of February and will scarcely get hard.

Mr. HAWLEY. This is a very successful preparation.

Dr. WILEY. It is perfectly simple and costs scarcely anything to run it through a milk separator. It runs through very rapidly, and all the mud and yeast and everything of that kind that it contains is brought out. It saves you the pasteurization, which many people think injures the taste of the cider. I do not think it does, but some people do. This, by the way, Mr. Chairman, was made of a winesap apple, and I suppose you will pardon me for saying that the apples were grown on my farm.

The CHAIRMAN. That makes it better still.

Dr. WILEY. If you want to keep sweet cider a long while, there is some two years old; and I will venture to say it is just as good as the day it was put up. There is no "dope" in it either.

Mr. HAWLEY. Are you willing to submit it to the physical test by this committee?

Dr. WILEY. Yes, sir. If you have a can opener here, we will open it. That of course is pasteurized. We have kept cider in barrels for over two years. It will keep perfectly sweet through the summer and the winter if it is pasteurized when it is put in the barrel.

Mr. STANLEY. How do you pasteurize it—with heat?

Dr. WILEY. With heat. Then we cool it through a cooler before we put it in the barrel.

Mr. HAWLEY. What is the temperature of the heat?

Dr. WILEY. About 150 or 160 degrees.

Mr. STANLEY. How do you get that temperature—from hot water?

Dr. WILEY. Hot water or steam; in any way, so as not to get it too hot.

If the grape is still permitted to be cultivated in this country and used as it has been used for thousands of years, it is important that the product of the grape be pure. I want to tell you, gentlemen, that I think nearly all the sound basis for prohibition is due to adulterated wines and beers and liquors.

Mr. LAMB. I agree with you.

Dr. WILEY. While I am a prohibitionist, if we can not get the pure article, I should like to be permitted as long as I live, if I want to do so, to take a glass now and then of absolutely pure wine. That we can make it in this country we have now demonstrated after four years of successful making of wine in a region where they told us we could not make wine without doctoring the grape. I said: "You can make it;" and we have made it in quantities. This is the first vintage, the oldest vintage we have, that I have in this bottle here. It was stirred up a little in coming along, so that it will not be quite as clear as it should be. But there is a wine that has nothing in it but grape juice; not a particle of burnt sulphur or any chemical of any description. It is perfectly fermented—what we call a perfectly dry wine. It has all the tannic properties and styptic properties and flavor of the high-grade wines of the vineyards of France. And while it is young yet—it is only three years old—after five or six years more it that bottle I will venture to say that there will not be a bottle of Burgundy or port of Cabernet that you can open that will be any better than this wine of Virginia grapes, made by a Virginian, in a Virginian laboratory, and made with nothing but grape juice.

Mr. STANLEY. Will wine age as well in bottles as in a cask?

Dr. WILEY. Yes.

The CHAIRMAN. What were the conditions that led to the opinion that wine could not be made at this particular place without adding something to it?

Dr. WILEY. First, ignorance of the composition of the grape, which they did not know anything about. They never had had an analysis made. Second, cupidity. By the ordinary methods of making wine here in the East, they make about 3 gallons of wine out of 1 gallon of grape juice. Of course that means more wine to sell; but it is only one-third as good; so I do not see where the profit comes in. But if you go to winemakers to-day here in New York and Ohio, they will take oath that you can not make wine without adding sugar to it and making it stronger with alcohol, and all that sort of thing; and they really believe it. They take oath, and honestly, that they can not do it.

Mr. McLAUGHLIN. It is made stronger by the use of those things, is it not?

Dr. WILEY. Yes; but when you drink wine you do not want to drink rum. That is what the addition of sugar makes it. You want to drink wine.

The CHAIRMAN. What is the proportion of alcohol in this?

Dr. WILEY. About 9 per cent.

The CHAIRMAN. Would this be called a kind of claret?

Dr. WILEY. It is too red for a claret. Claret is a light-red wine.

The CHAIRMAN. What would it probably be called if it went on the market?

Dr. WILEY. I would call it exactly what it is—Virginia red wine. That is the only name I would give it. If you like a dry wine, with a nice styptic taste, you will like this. That is what makes a fine wine, in the judgment of a connoisseur; it must be dry; there must be no sugar in it. You must get the taste of the tannin—what they call the styptic or tannic taste.

The CHAIRMAN. What is a dry wine?

Dr. WILEY. A dry wine is one in which the sugar has all been fermented. It is not sweet. That is the technical term given to a wine that is perfectly fermented.

Mr. HAWLEY. Does it have a higher alcohol content?

Dr. WILEY. It would, of course; because if your sugar is not fermented it gives you that much less alcohol. But I want you gentlemen just to taste this wine, because I will tell you a little story about it in a minute.

Mr. LAMB. Would they let you sell this in Kansas?

The CHAIRMAN. No, indeed.

Dr. WILEY. A short time ago I had as my guest the gentleman who is the head of the wine and spirits department of the Army and Navy Stores—that great store in London. He is, perhaps, the best judge of wine in England, and perhaps in the world, because it is his business to supply wines to the English army and navy through that store. I gave him this wine with no label on it. Unfortunately, I had carried it a little, and the sand which should stick to the bottom had been stirred up a little in the wine, just as it has a little in this, but not enough to spoil it. He tasted it, and then he looked at it and smelled it, and tasted it again three or four times. "Well," he said, "you have got me beaten this time. I can not tell you what that wine is."

He said: "It is splendid wine, but its type and character are unknown to me." He said: "It tastes to me like a mixture of one part of Burgundy and one part of Bordeaux"—high-grade red wine. I thought that was a great compliment to pay to wine made right here almost at our doors.

We have gone into Ohio, at Sandusky, and we have made wine there for two years with the same success. I wish I had gotten from Charlottesville some of my sparkling cider which we made there. We have absolutely demonstrated that when it comes to the making of cider, you can not get to-day a better bottle of cider in Normandy than we can give you there at Charlottesville. I do not believe you can get better fresh cider anywhere than this. We have done that in four years' investigation. We have analyzed the grapes; we have told the people what the grapes contain—how much sugar, how much acid, how much tannin. We have shown them how to handle these grapes, and how to ferment and how to rack them, and get them clear of their detritus; and they are now getting just about old enough to put into bottles.

Mr. LAMB. Are you going to send out a bulletin about it?

Dr. WILEY. Yes; we have already printed a lot of bulletins about cider, and they have gone all over this country; and there has been a revolution in cider making in this country.

Mr. LAMB. I wish you would send me some of them.

Dr. WILEY. If we have any still available, I shall be glad to do so. You know, we can print but a thousand copies of these bulletins.

The CHAIRMAN. What is the particular process in the making of wine that produces the sparkling wine?

Dr. WILEY. That is the simplest thing in the world. A sparkling wine is started just like an ordinary wine. It is fermented in a big open tub or cask, usually for 8, 10, or 15 days, according to the temperature. Then it is put into barrels and allowed to stand for two or three weeks, and sometimes longer—say a month—so that the sediment will sink. Then this wine is drawn off. It is not yet all fermented. It is partly fermented. It is done in the fall, you know. This first ripening is in the winter. It still contains a certain quantity of sugar. It is immediately put in the bottles in which you see it when you buy it, and the bottles are stoppered, and the stoppers tied down, and the bottles are put in long racks with the stoppers down. Thousands and hundreds of thousands of bottles are sometimes put in a cellar; and there they undergo this secondary fermentation in the bottle. That produces carbon dioxide, which becomes dissolved in the liquor and produces the pressure, and gives off gas. At the same time the mud or residue settles on the cork. Every day the attendant goes through those cellars, and takes each bottle and gives it a little shake, and then turns it a quarter of the way around; and next day he comes back that way, and does that for two years, 24 months. By that time all of the wine is perfectly clear and brilliant, and all the mud is compactly on the cork. Then the problem is to get rid of that mud without wasting the wine. The old way was to cut the cork, and with a quick motion allow it to blow out and blow the mud out. A skillful man would turn the bottle up and save all the wine except the few drops that blew out. In modern days they put the bottle in brine and freeze it down over the mud, and then draw it out like a cork; so that it saves still more wine in that way, and makes a very clear wine.

The CHAIRMAN. Could sparkling wine be made out of this that you have here by putting it through that process?

Dr. WILEY. Yes; that would make a magnificent sparkling red wine.

The CHAIRMAN. Would it make a sparkling white wine?

Dr. WILEY. If you want to make a white wine, you have got to press the juice first. The grape juice does not dissolve the coloring matter of the skins; it is only the alcohol that does that. The red wine is always fermented in a mashed grape—not the expressed juice—and as the alcohol is produced it dissolves the red coloring matter of the grape. White wine can be made from a red grape by pressure and treatment of the juice by itself. White wines are always made by fermenting the juice separately, whether made from white or red grapes, so that there is a distinct difference in the way of making white wine. It is quite different in flavor, even when made from the same grape as that which is made by fermenting with the skins and cores.

Mr. HAWLEY. That bottle of wine, you say, was made by a gentleman in Virginia and bottled by him?

Dr. WILEY. Yes, sir; it was made by an expert connected with my department who has a laboratory at Charlottesville. We went down

there, because that is quite a wine-producing country, and we took the same grapes that they did.

The CHAIRMAN. I believe the people who know think the European champagne is of a very much higher quality than the American product. What difference is there in the process of manufacture that would make a difference in the quality?

Dr. WILEY. None whatever. They are all made alike.

The CHAIRMAN. Then, is it true, and if so, why is it true, that American wine is not equal in quality?

Dr. WILEY. I would not say that. I would say it is different in quality, just as European wines are different from American wines. I know a lot of men with good taste who prefer an American sparkling wine to a European one; and, as a rule, I do, too. There are certain brands, though, made in the great champagne country of France which can not be equaled anywhere in the world. They have been made for hundreds of years, and the environment is right there to do it; but the ordinary sparkling wines of Europe, in my opinion, are very inferior in quality to those made in this country.

The CHAIRMAN. What is the difference between an ordinary sparkling Burgundy and champagne?

Dr. WILEY. A champagne is made only in the champagne country, and by the French law no other sparkling wine can be called "champagne" except that. A sparkling Burgundy is made in Burgundy out of the ordinary red wine which you see as Burgundy, except that it is treated as champagne is treated in the champagne country. There is no difference in the method of treatment; but experts will say that the sparkling red wine as a drink is not to be compared with the real champagne. This cider which has just been opened is 2 years old.

Mr. HAWLEY. Was it made just like the cider in the jug?

Dr. WILEY. It was put through a milk separator and then pasteurized and put in this can. This is some that was made in the orchard of your late colleague, Mr. Pollard. We sent our men out there to his place and made it right in his factory.

The CHAIRMAN. I remember that this matter came up two years ago and he was very much interested.

Dr. WILEY. It is perfectly sound, sweet cider to-day.

Mr. HAWLEY. It would not have remained sweet if it had been exposed to the air, would it?

Dr. WILEY. Oh, no; it would have been vinegar by this time.

Mr. STANLEY. Have you any way to keep cider from becoming vinegar? Can you have it reach a certain alcohol content and then hold it?

Dr. WILEY. Do you mean cider, or vinegar?

Mr. STANLEY. Cider.

Dr. WILEY. Oh, yes. You can prevent cider from becoming vinegar if you just keep the acid that ferments out of it by pasteurization. By keeping it away from any contamination, it will keep hard for an indefinite period.

Mr. STANLEY. There is one other question I want to ask about that wine. Can you make a fine quality of wine without having a cellar deep enough or situated in some way so as to preserve an even temperature?

Dr. WILEY. You have got to have a deep cellar.

Mr. STANLEY. How deep do you have to make your cellar?

Dr. WILEY. Oh, 8 or 10 feet. That is all that is necessary.

Mr. STANLEY. Is that enough?

Dr. WILEY. Yes; plenty.

Mr. STANLEY. The reason I am asking you is because I have a few bottles of wine in a cellar, but I am afraid I have it too close to the furnace; and my cellar is only about 12 feet deep. I did not think it was deep enough.

Dr. WILEY. Oh, that is plenty deep enough.

(Thereupon, after an informal discussion between members of the committee and Dr. Wiley, who submitted the papers which follow, the committee adjourned until to-morrow, Wednesday, December 14, 1910, at 10.30 o'clock a. m.)

ENFORCEMENT OF THE FOOD AND DRUGS ACT.

This increase is distributed among the various laboratories and divisions as shown on the three-year report. It is made necessary by the following:

First. The amount of time required by analysts and inspectors to attend court cases as witnesses, and to work up evidence required by district attorneys, greatly reduces the time that can be devoted to the regular inspection and analytical work, as well as to investigations. In order that the regular work can be kept up it is necessary to increase the force.

Second. All travel and other expenses of witnesses in connection with cases under the food and drugs act are paid from this fund. This includes not only the members of the Bureau of Chemistry, but also such outside experts and other witnesses as may be necessary.

FOOD DIVISION (CURRENT WORK).

Analyzing imported food samples, checking analyses of branch laboratories; study of new methods of analysis and methods for detecting adulteration in foods; examination of domestic food products which enter interstate commerce; investigating technical methods connected with the manufacture or preparation of foods; investigation of city milk supplies which enter interstate commerce; investigations relative to the treatment of oysters; study of oils, fats, and waxes commonly used in foods; study of influences of receptacles on the character and composition of foods, and study of the relative value of materials used in the preparation of such receptacles; a study of the maturing of whiskeys and of the changes in composition that occur in the conversion of cider to vinegar; a study of canned goods with a view to determine the relative suitability of different varieties of foods; a study of the organic acids in various types of foods for the purpose of improving methods of analysis and increasing the data on which judgment of the purity and strength of foods may be based; an extensive and elaborate investigation in collaboration with experts concerning the whole question of food colors and identification and a construction of analytical trees for this purpose; a study of the effects of aging on the composition, varieties, characteristics, and bread-making properties of flour; a study of phosphoric acids in jams and jellies; a study of the composition of vanilla extracts prepared by different methods and detection of caramel therein.

FOOD DIVISION.

I. *Study of methods of manufacture.*—Additional foods will be taken up as the studies now under way are completed, for the purpose of increasing our information regarding the products and of affording data for the interpretation of methods of judging of the quality and purity of such foods.

DRUG DIVISION (CURRENT WORK).

Analyzing imported drug samples and checking analyses of branch laboratories; study of methods of drug analysis and methods for detecting adulteration therein; testing domestic drug samples that enter interstate commerce; the study of synthetic products and preparations containing them; a study of the preparation of organic compounds; investigating essential oils; a study of the pharmacological action of drug products; investigation of certain drug products imported into the United States which

may be dangerous to the health of the people, especially the so-called "habit-forming drugs;" a study of the influences of caffeine and caffeine products on metabolism; study of the poisonous effects of amyl and ethyl alcohol with regard to the toxicity of alcohol and aldehydes; investigation of the so-called "soft drinks" which contain ingredients that may be deleterious to health; study of the methods of determining the various alkaloids and other constituents contained in the complex mixtures upon the market; testing chemical supplies furnished this and other departments by contractors; examination of drug products for the Post Office Department, in order to prevent fraud by use of the mails; study of new methods of analyses.

ADDITIONAL PROJECTS.

There are a large number of preparations on the market which we have been unable to do anything with on account of lack of force. In fact the drug problems are so numerous that we have not made more than an impression on them during the past few years.

Surgical dressings.—This important line of products we have endeavored on several occasions to study fully, but have not been able to do so on account of lack of force.

Medicines for domestic animals.—This large line of preparations has virtually received no attention.

Considering the importance of the subject, comparatively little time has been given to soothing syrups, cough remedies, and other preparations containing habit-forming agents, such as opium, morphine, codeine, cocaine, etc., and similar conditions obtain relative to so-called consumption cures, epilepsy cures, etc.

Two other lines of goods sorely need attention. These are remedies used by the dental profession and commodities shipped into interstate commerce direct to physicians. The latter are known as physician's supply houses. It is a well-known fact that the goods delivered by these supply houses are of an inferior character.

INSPECTION WORK (CURRENT WORK).

Collecting samples, inspecting food plants, gathering evidence of interstate shipments, work incident to seizures, investigating complaints, conducting special investigations, and other work in connection with the enforcement of the food and drugs act.

INSPECTION.

I. If the character of inspection work which has been undertaken for the past two years is to be maintained, it will be necessary to secure an increase of the inspection force. There are only 38 available inspectors, and if the exclusive time of every one of these was given to police work the inspection required for an adequate enforcement of the law would not be complete. There has not been serious interruption in the past due to attendance as witnesses in court cases, but our experience so far this year, since the Federal courts convened early in the fall, has indicated that a large percentage of the time of an inspector will be devoted to working up the evidence required by district attorneys in prosecuting cases instituted upon samples previously collected.

II. There is manifest disposition among manufacturers to contest not only charges of adulteration, but interstate shipment. District attorneys expect and require inspectors to effect the attendance of railroad employees and dealers to establish a complete chain of evidence, and there is on record more than one instance where it was necessary for an inspector to give practically two weeks of his time to the prosecution of one case alone. This of course is a considerable travel expense.

FOOD RESEARCH WORK (CURRENT WORK).

Investigations relative to handling, shipping, and preserving poultry, eggs, fish, game, and other foods, with special reference to putridity and decomposition of these products in order to determine their fitness or unfitness for interstate commerce under the food and drugs act; experiments to indicate the effect on the keeping qualities of fowls under the various methods of handling. These lines of investigation include both field work, and bacteriological, chemical, and histological laboratory work.

MISCELLANEOUS DIVISION (CURRENT WORK).

Study of mineral waters; examination of samples of waters under the food and drugs act; study of methods of analysis of cattle and poultry foods, and studies of methods of detection of adulterations therein in connection with the enforcement of the act; study

of the radio-activity of mineral waters, including the investigation of this subject at the sources of certain springs; study of sulphur waters in connection with the enforcement of the food and drugs act; study of insecticides and fungicides and field studies of the effects of lead arsenate on foliage; study of the effects of trade wastes on vegetation; study of new methods of analysis; study of the relative feeding values and commercial importance of grains; examination of miscellaneous supplies for this bureau and for other departments of the Government; study of range forage crops; study of the milling and baking quality of cereals and other products.

MISCELLANEOUS DIVISION.

I. Study of the chemical composition of various irrigation waters of the East and arid and semiarid West to determine from such studies which waters are suitable for irrigation on certain crops and on certain types of soil.

II. The insecticide and fungicide laboratory will carry out both orchard and laboratory tests of poisonous compounds much used at present as insecticides, with a view to finding substances that may be used on peach and other tender foliage with a view of replacing poisonous insecticides by those which are nonpoisonous or less poisonous.

III. Investigation of fruits to which arsenicals have been applied in spraying operations, with an idea of ascertaining whether under ordinary conditions of spraying sufficient amounts of poisons are present in fruits to be injurious to the health of human beings.

IV. The cattle-food and grain-investigation laboratory, in addition to the work which it has always performed, desires to make a study of improved methods of analysis of cattle-food materials. The present methods of analysis are far from satisfactory, and much new investigative work will be required to determine the best methods of examining this class of materials.

ANIMAL PHYSIOLOGICAL CHEMISTRY (CURRENT WORK).

Study of methods of analysis employed in physiological work; digestion experiments on lower animals, including metabolism and feeding experiments on lower animals; study of infant's and invalid's foods on the market, including a study of the character, preparation, and manufacture of such foods, for use in enforcing the food and drugs act.

ANIMAL PHYSIOLOGICAL LABORATORY.

I. The analysis and study of infant foods and infant feeding.

II. The development of a method to determine the length of time flesh foods are kept in cold storage.

III. A practical test of the effect of so-called diabetic foods on patients suffering with diabetes.

MICROCHEMICAL LABORATORY (CURRENT WORK).

Microscopic examination of samples of foods and drugs which are analyzed in connection with the enforcement of the food and drugs act (the microchemical examination of all samples are made in this laboratory); study of new methods of analysis and perfecting methods for detection of adulteration in food products; investigation of the condition of eggs and egg products; histological study of the structure of drug plants for the purpose of identifying the ingredients in medicinal mixtures; study of mustards and adulterations used therein.

BACTERIOLOGICAL INVESTIGATIONS (CURRENT WORK).

Bacteriological examination of samples of foods and drugs; study of the wholesomeness and sanitary condition of foods; investigations of various dressings, bandages, pads, ligatures, etc., used in surgery; study of methods of bacteriological examination; bacteriological examination of oysters and milk supplies; investigation of frozen and desiccated egg products.

BACTERIOLOGICAL LABORATORY.

I. A continuation of the investigations pertaining to oysters, frozen and desiccated eggs, milk, ice cream, and dairy products. Collection of water samples from the source and a study of their sanitary surroundings.

II. A study of the different kinds of infant foods on the market, including a detailed investigation of the various ingredients entering into their composition.

III. Investigations pertaining to the growing of vegetables intended for consumption uncooked, such as celery, lettuce, water cress, etc.

IV. Detailed study of fermented sour-milk preparations, which are being largely exploited on the market to-day because of their reputed medicinal value.

V. The examination of edible gelatin, such as is used by confectioners, etc.

VI. A study of the different antiseptic and germicidal preparations on the market advertised as having special virtue, such as antiseptic tooth pastes, soaps, etc.

VII. Further study of the sterility of surgical dressings, catguts, ligatures, etc.

SUGAR LABORATORY (CURRENT WORK).

Examinations of sugar, sirup, and honey samples taken in connection with the enforcement of the food and drugs act; study of the methods of analysis of sugar products and study of methods of adulteration in sugar products.

SUGAR LABORATORY.

I. *Composition of American commercial glucose.*—This study is to determine the constituents and amounts present in the commercial article and also to work out methods for its detection in food products.

II. *Composition of imported honeys.*—Considerable honey is imported into this country from Mexico and the island of Cuba, Santo Domingo, and Haiti. It is the purpose of this study to determine the constituents and their relative proportions so that we may be able to determine adulterations of this material, and also to compare the figures for imported honeys with those of American honeys.

III. *Composition of sorghum sirup and molasses.*—Sorghum sirup and molasses is used to a considerable extent as a food product and up to the present time there is little known as to its chemical composition and chemical characteristics. The study purposes to determine these and also to study pure products that adulteration may be detected. This is a new project that it is hoped will be taken up in the fall of 1911.

IV. *Composition of cane sirup, open-kettle molasses, and vacuum molasses.*—In these products, as well as in the above (sorghum), little is known of their chemical characteristics, and it is the purpose to study pure products to better determine their adulteration. This is a new project and will receive attention as soon as practicable.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Wednesday, December 14, 1910.

BUREAU OF SOILS.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman) in the chair.

The CHAIRMAN. The committee will come to order. We are to consider this morning the estimates for the Bureau of Soils, and Dr. Whitney, the chief of that bureau, is before us to give us the benefits of his information in relation to the various details appropriated for.

Before taking up the items in the estimate, Doctor, we would be glad to listen to any statement of a general character that you would like to make relating to the work of your bureau during the past year.

STATEMENT OF DR. MILTON WHITNEY, CHIEF BUREAU OF SOILS, AGRICULTURAL DEPARTMENT.

Dr. WHITNEY. Mr. Chairman, I have a written statement that I will be glad to read, or to make an oral statement, whichever is preferred.

The CHAIRMAN. I may say to the members of the committee that I requested Dr. Whitney to present a written statement, not because he ever has any difficulty about expressing himself extemporaneously, but because I thought such a statement, if made without interruption, would perhaps present a more connected review of the work than the committee would permit him to make if he spoke extemporaneously. So we will listen to the written statement.

Dr. WHITNEY. The soil survey work has been pushed forward in 26 different States, comprising in all 59 areas and a total of 22,762 square miles. In the reconnoissance surveys a total of 79,108 square miles has been completed in the Great Plains region, in western Pennsylvania, in western Washington, and in Texas. Up to July 1, 1910, there have been surveyed 204,276 square miles and 155,288 square miles of reconnoissance surveys, or a total of 359,564 square miles, or an area larger than the German Empire and England together.

During the past summer I have personally given a great deal of attention to a revision and analysis of the data collected in the past 10 years by the Soil Survey, and have prepared the manuscript of a bulletin describing all the soils in the eastern half of the United States and their best use in such terms as will enable the farmers to better appreciate the use of and value of the soil maps. There is also being prepared a series of bulletins assembling the information gained through the soil survey in a constructive way to simplify and make still more useful the main soil facts in the possession of the bureau.

The interest in soil work is steadily but rapidly increasing in the country as shown in the increasingly insistent and strong demands for soil surveys and by the interest taken by the States themselves. Twelve of the States are appropriating directly or indirectly about \$50,000 a year to be spent in cooperation with the bureau to hasten the mapping of their States as they are desirous of using the soil survey maps to base other agronomic work upon.

The following six States are appropriating from \$5,000 to \$10,000 each: Alabama, Mississippi, Missouri, Pennsylvania, Washington, and Wisconsin. The remaining six States are spending from \$1,000 to \$2,000 each for such work. Several other States are actively planning similar cooperative work which will be embarrassing for the bureau to meet without the increase in appropriation that the Secretary has asked for.

The soil mapping in a number of States has already extended over more than half their area. It is thought to be especially desirable that the work in some at least of these States should be pushed to completion as rapidly as possible in order that such States and such work may be utilized for the planning and execution of experimental work on a comprehensive scale. It seems especially desirable to have a soil map of a whole State completed in order to bring out more thoroughly than has been possible on the isolated areas mapped so far the value of soil maps in the planning of comprehensive study of agricultural conditions. The soil survey is coming more and more to be regarded as an institution for fundamental soil study in the field as a preliminary to all experimental work.

In the States of the Great Basin and Pacific coast the soil survey has been brought to play an important rôle in connection with the settlement and the utilization of the soil resources of the districts studied, as well as in the development of State and Federal irrigation projects.

In the State of Washington the survey of an area of 3,568 square miles has been completed. This covers large areas of logged-off and burned-over forest tracts adjacent to Puget Sound and embraces the compilation of maps indicating the adaptation of soil types to the various systems of crops and reforestation. This State is now confronted with the problem of developing vast areas of such unutilized, unproductive tracts, a considerable portion of which has been returned to the State for unpaid taxes. The work of the survey, which has been undertaken in cooperation with the State, will require three or four more seasons for its completion, and is expected to provide a basis for the organization of practicable means for rendering State aid in the clearing and development of the lands, including reforestation of such tracts as are found unsuited to agricultural purposes.

During the last few years a great deal of attention has been directed to the utilization of the Great Plains region as a farming country. The demand for land, especially for cheaper land, has been great, and the eyes of many farmers have been turned westward, and immigration has forced its way into the semiarid region heretofore used mainly for grazing. Large ranches have been cut up into small farms and sold to farmers, and practically all of the cultivable Government land has been homesteaded. Many individuals, companies, and corporations are exploiting and advertising the western lands, and the

influx of settlers into the western plains has been enormous within the past few years. Many inquiries are received by the Bureau of Soils from people who are contemplating moving into the western country for the purpose of farming and from people already living in the West who are desirous of obtaining information concerning soil problems.

In order to gather information along soil lines which would be available for the people of the West and for the people who wish to move to the West, the Bureau of Soils, in 1908, inaugurated extensive surveys in the Great Plains. The importance of gathering the information as rapidly as possible was recognized by the bureau and it was decided to make rapid surveys of large areas, mapping the soils on small-scale maps. These reconnoissance surveys have covered the western half of North and South Dakota and three large areas in Texas—one in the extreme northwestern part of the State covering the Panhandle section and two areas in the extreme southern part of the State bordering the Gulf.

The value of the reconnoissance soil survey may be summed up as follows:

(1) Information is gathered and supplied to the homeseeker, enabling him to understand thoroughly the conditions in this new country and to show him the location of the soils adapted to the type of farming in which he desires to engage.

(2) Information is gathered and furnished the farmer living in the region which aids him to overcome the bad effects arising from either some inherent soil trouble, such as alkali, poor drainage, or mistake in crop adaptation; or arising from improper tillage methods during seasons when climatic conditions are not favorable.

(3) It furnishes a broad and comprehensive basis for the future scientific work of national or State agricultural scientists in studying not only soil problems but general agricultural problems.

In other sparsely settled regions, like the Great Plains region of the West, the Ozark region of Missouri and Arkansas, and the mountainous portion of the Appalachian region, the reconnoissance work will supply general information concerning the soil, climate, and agricultural possibilities. This information is being very much sought at the present time for the Great Plains and Ozark regions by a great many persons who are searching the country over for cheap land on which to establish homes.

At present the demand is fairly well satisfied with the information given in the reconnoissance survey reports. It is for information concerning the general character of the soils, topography, climate, and cropping possibilities. After the region has become occupied by farmers and agriculture has become established, detailed work will be taken up in these regions.

SOIL LABORATORIES.

During the past year considerable progress has been made in soil-fertility investigations. The investigations include such prominent soil problems as those presented by the very unproductive Volusia soils in New York and neighboring States, the peat lands on the Atlantic coast, as well as other unproductive lands in a large number of other States. As an illustration of other important lines of

research I might mention the following: The organic matter in some of these soils has received especial attention and the organic nitrogen and phosphorus forms have been determined. These have an important bearing on the availability of these essential constituents. We have found that the nitrogen and phosphorus are tied up in these soils in very resistant forms as constituents of a larger complex known as nucleic acid, which also contains a sugarlike principle. To effect the liberation of the nitrogen and phosphorus in available forms, this complex must be broken up into its constituent parts. This has been done in the laboratory and the nitrogen and phosphorus obtained in such forms as are utilizable by plants. The best methods of rendering the unavailable forms effective for crop growth are being studied. Fertilizer requirements of soils were made on soil types from various parts of the United States by soil-laboratory methods devised by this bureau. In all these soil types the response of different fertilizers was studied and the fact determined whether the soil was in need of liming and whether it responded most to a nitrogenous, a potassic, or a phosphatic fertilizer and what was the best ratio of these constituents.

In connection with these problems some far-reaching discoveries have been made in soil investigations. In these researches over 20 definite organic soil constituents have been isolated, identified, and classified. These show us the nature of soil material and the processes of decomposition and decay as has not been previously possible. Previous to this work, although half a century of investigation along these lines is recorded, not a single definite compound or fact in connection with the organic matter of the soil was established. Some of these compounds are harmful to vegetation and so have direct effect on crop production. Their properties have been and are still being studied, as well as their distribution in the soils of the United States, with a view to correlating the various properties of soils in respect to their fertility. The influence of fertilizers on these organic constituents is also being pushed and some very promising results are already in hand.

The oxidative power in soils and the effect of plant roots on oxidation and reduction is another subject in which facts having important bearing on soil fertility have been determined during the past year. In addition to the lines of work here enumerated, a number of other lines are in progress in the laboratory and in the field bearing on the influence of fertilizers on soils and other soil ameliorations.

The time has passed when an examination of soil can be based upon a chemical analysis of the mineral particles, and we now view the soil as a functional body which has many properties aside from the minerals which it contains. Among the important functions is the change of the organic remains of plants and animals which must break down in certain rather definite lines to continue the soil in its highest degree of productivity.

The analytical work of the laboratories has continued to increase, owing to the growing demands, not only from the bureau itself, but from other bureaus and other authorized sources.

The composition of soils as related to the crop-producing power has been further studied. It has been shown, for instance, that some Chinese soils, which are known to have been under cultivation for upward of 3,000 years and probably without fertilization, show

on analysis as much or more mineral nutrients as the average good producing soils of this country. Examination of many soils of this country by modern refined mineralogical and optical methods has shown the very wide distribution in all these soils of all the common rock-forming minerals in the soil as such. These results confirm the previous work of the bureau, indicating that the loss of plant nutrients from the soil is not the serious problem it is popularly supposed, and that the rational use of fertilizers must be determined by other functions. Further confirmation of the great heterogeneity of soils is furnished by an investigation of the distribution of barium, an element which has been supposed to render poisonous plants which absorb it. This element was found in practically every soil tested, covering all kinds of soils from nearly all parts of the United States.

Studies have been continued of the properties of the soil solution, the formation of soils, and the translocation of soil materials, important results having been obtained and published.

SOIL-WATER INVESTIGATIONS.

The work in soil-water investigations was carried into Mississippi and neighboring States, which the expert in charge revisited after an interval of 20 years in order to study the advance in soil erosion and note the effect of devices for protecting the soil from storm wash. In some counties the waste was found greatly extended; but elsewhere the means of protection advocated 20 years ago—contour cultivation, seeding with Bermuda grass about small gullies, and planting locust and other shrubby trees in larger washes—have proved effective, so that on the whole the productivity of the upland soils is no longer diminishing and may even be increasing. The material for a bulletin on soil erosion was brought together during the year and submitted for publication. It describes various devices for protecting fields from destructive soil wash:

The work extended to an investigation of the ground water generally found at a moderate depth beneath the surface, and forming a store frequently raised by capillarity through the subsoil to maintain the requisite soil moisture and sustain the plant growth. A systematic effort was made for the first time to determine the depth of ground water beneath the surface throughout the country by correspondence relating to the depth of wells. Some thirty thousand inquiries were sent out, and most of these brought useful replies, which are now being tabulated. The inquiries were supplemented by field studies in several States. These studies indicate that throughout much of the Great Plains the ground water is derived in part from the rainfall in the Rocky Mountains and their foothills on the west, of which a part enters porous strata inclining eastward and moves down the slope, some times reappearing as artesian flow, but generally escaping upward to within reach of soil capillarity where it supplements the local rainfall in rendering the soil productive.

Mr. Chairman, I think I have touched the high points in the work of the bureau during the past years. If there are any questions I shall be glad to answer.

The CHAIRMAN. Have any members of the committee questions they would like to ask the doctor in relation to the general work of the bureau?

Mr. LEVER. I would like to ask Mr. Whitney to go a little more into detail with reference to the work in connection with fertilization and what experiments have been made in the use of fertilizers.

Dr. WHITNEY. We are making investigations for the purpose of determining how fertilizers act. It has become quite evident to us that the main effect of fertilizers is not merely the amount of additional mineral food they supply, but that they must have some other effect on soil, on some of the functioning properties of the soil; and it is those lines that we are investigating. We are finding that the application of fertilizer to a soil corrects or changes some of the organic constituents that would otherwise be harmful, and we have an exceedingly interesting line of investigation that has just been completed, and has just been submitted to me within the past two weeks for publication.

It is something we have been looking for for some time, namely, a soil or a series of soils upon which we can grow wheat and get responses from potash on one soil with the wheat plant as an indicator, and from phosphoric acid on another soil with wheat as an indicator, and from nitrogen on another soil.

We have found three organic substances, one of which, when put into culture solutions and wheat grown in them, responds to potash; another of these substances responds to nitrogen, and the third substance responds to phosphoric acid. So that we have found three definite compounds of the soil which can respond differently to the three principal elements of fertilizers.

The CHAIRMAN. What is your practical deduction?

Dr. WHITNEY. Well, in practice I can see no reason to doubt that if any one of these three substances had been in the soil as they were in the medium that we grew the wheat plant in the wheat plant would have responded to the phosphoric acid if we had had one of these compounds present; it would have responded to nitrogen if we had had another one, and it would have responded to potassium if we had had the third.

The CHAIRMAN. Does that go to argue that a chemical analysis of the soil would determine whether in a given case you should use potash or phosphorus or nitrogen?

Dr. WHITNEY. Oh, yes; a chemical analysis of the organic material, not the mineral material; a chemical analysis and identification of the organic constituents; and those are the lines that we are pushing now. The chemistry of mineral matter is fixed and that doubtless determines the normal differences in soil that we may not at present hope to understand. It is just as fixed as the normal differences in men or in animals. When we come to functional activities and the organic constituents that may change from day to day, and certainly will change from season to season and according to the crop grown and the care the soil has had, we may expect to find the cause of the temporary or abnormal conditions which lead to the temporary impairment of the productive power of the soil.

Mr. LEVER. Is it possible to reach those same conclusions by actual experiment upon the soil with the different kinds of crops under different kinds of fertilizers?

Dr. WHITNEY. No. The ordinary form of plot experiment in the field is useful to the person who makes it. It throws no light upon your neighbor's farm, because his farm may have been under different

cultural methods from your own. And, furthermore, in the plot experiments we find that even if they are continued for 60 years the responses from year to year vary enormously, probably according to the character of the seasons; certainly we do not get consistent and uniform results even in the long-time experiments which have been carried on.

Mr. LEVER. As I remember it, you had such a plan in mind several years ago, did you not?

Dr. WHITNEY. In a general way, yes. Much good can be done with the fertilizers for different soils if you take the uniform type of soil and in a locality where the methods and crop industries are about the same.

Mr. LEVER. For instance, take the matter of wheat growing on uniform soil under like conditions as to rainfall and moisture, etc. It seems to me you ought by demonstration to obtain the best fertilizer for that particular kind of soil.

Dr. WHITNEY. That can be done, and we have methods now for testing the fertilizer requirements of soils.

Mr. LEVER. Are you doing any work along those lines?

Dr. WHITNEY. No field work except experimental work at the Arlington Farm and cooperation at one or two experiment stations. We have a very interesting scheme of plot experiments that we have put out at one or two places. It is to enable us to carry on these laboratory investigations and confirm the results we obtain there.

Mr. LEVER. When you consider this country consumes about \$100,000,000 worth of commercial fertilizer in a year, a large part of which is wasted through a lack of intelligent application, that seems to me a very big field to work on.

Mr. WHITNEY. It is a big field; it is an important field.

The CHAIRMAN. Are your experiments directed to ascertaining the quantity of fertilizer in a given case that will bring the best results?

Dr. WHITNEY. Yes; the quantity, but more especially the ratio. There is an important difference in the ratio of these ingredients to each other. It is not only a question of how much there is, but it is a question of the proportion of nitrates and phosphates and of potash. It is a very interesting study and a very important practical matter.

The CHAIRMAN. My question was prompted by a recollection of what the men who were investigating irrigation have reported, namely, that in many cases they find better results are obtained with one-third of the water which had formerly been used. And I wondered if it was likely that the people of this country were making a similar mistake in regard to fertilizer and using more than was necessary.

Dr. WHITNEY. They are using more, Mr. Chairman. The summer before last I brought together the results of all the plot experiments that have been made by the experiment stations since their establishment. I think there were some 20,000 or 25,000 results, and these were brought together according to the crops. That is, all the experiments with wheat were put together and all with corn. If I had thought of this discussion taking this form I should by all means have brought up the series of bulletins that was prepared.

We found there that the amount of fertilizer, when ranged from the smallest amount that has been tried in experiments to the largest

amount, made on the whole no difference in the yield. They give practically as good results in smaller applications as they do in larger applications, showing evidently that the actual amount of fertilizer needed to get best returns was very much less than we have been considering necessary.

Mr. LEVER. Do you remember what your smallest amount was?

Dr. WHITNEY. Roughly it is 100 pounds per acre.

Mr. LEVER. If you can demonstrate that, you will save to my people in South Carolina many millions of dollars in fertilizer bills every year.

Dr. WHITNEY. There is no question but what the amounts as recommended in the past and as practiced in crop rotation have been far larger than have been justified by the increase in yield and profit.

Mr. Chairman, another very interesting matter that came out of this inquiry was that the responses to fertilizers were as great—and I have obtained every result that is available in the literature—on good productive lands as they are on poor lands.

The CHAIRMAN. Of course, relatively?

Dr. WHITNEY. Relatively, yes, sir; but the increase was approximately the same.

Mr. CHAPMAN. Does not the value of fertilizer depend a great deal on the cultivation given the land after the fertilizer is put into it?

Dr. WHITNEY. Oh, yes; and, of course, with very thorough cultivation there is often no necessity for the use of fertilizer.

Mr. CHAPMAN. Have you any experience in the use of ground limestone?

Dr. WHITNEY. We have made no investigation of that. It is generally accepted that on many soils it is as efficient or more efficient than the burnt limestone. On other soils the quick or air slacked lime seems to do better.

Mr. LEVER. Your bureau does not prepare any fertilizer formulas, does it?

Dr. WHITNEY. No. But I feel, Mr. Chairman, that the investigations we are making into the method of the operation of the fertilizer on the soil is laying a very broad foundation for future control of fertilizer practice.

Mr. McLAUGHLIN. A great many express the opinion that a fertilizer is only a stimulant and is not really a plant food, and not really what we call fertilizer.

Dr. WHITNEY. I think myself that the principal effect of the fertilizer is in correcting soil conditions and the effect is on the soil rather than on the plant. But whether it enters into the plant as a plant food after it corrects the soil is all the same thing, so long as you get an increase in growth. But the question as to whether it does enter in and is a plant food as such and goes to the upbuilding of the plant, or whether it controls the soil oil conditions and keeps the soil in better condition for the plant to function, would be a very important scientific question, because it is upon that fact that the rational basis of fertilization will eventually be worked out.

The CHAIRMAN. Have you not made laboratory experiments to determine whether or not you could grow plants on fertilizer alone?

Dr. WHITNEY. Well, you can not do that. It is easy to over-fertilize a soil.

The CHAIRMAN. But the question was directed to the proposition that you laid down a moment ago—that in your judgment the value of fertilizer was not as a plant food. I think you rather intimated that it did not contain any plant food.

Dr. WHITNEY. But I did not intend to convey that intimation.

The CHAIRMAN. Whether you did or not, it occurred to me the question as to whether there was an important quantity of plant food in any given fertilizer could easily enough be determined by attempting to grow grain in the fertilizer itself.

Dr. WHITNEY. If it is diluted you can grow plants in it, but in the concentrated form in which you use it you could not grow plants.

Mr. McLAUGHLIN. With what?

Dr. WHITNEY. With soil. That resolves itself into fertilizer practice again. But you would have to dilute it to the point of 100 pounds of fertilizer to 4,000,000 pounds of soil, which is very highly diluted.

The CHAIRMAN. If you dilute it with water, so as to render whatever elements of soil food there may be available for the use of the plant, would it result in any production?

Dr. WHITNEY. Oh, yes. If you use about the same amount of our commercial nitrate of soda and acid phosphate and sulphate of potash, you can grow plants to a fruiting period.

The CHAIRMAN. Is not that pretty conclusive proof that they do contain plant food?

Dr. WHITNEY. Oh, they undoubtedly contain plant food and contribute to the food of the plant, but the point I made was that in my judgment that was not the only important function of fertilizer. There were other important functions.

As an illustration of the meaning I might cite a case of a letter that came to me a short time ago asking for a chemical analysis of a soil. The writer said that he had just bought a farm that had been under the tenant system for 20 years and it was very much run down, and he wanted to know if we could make a chemical analysis. While I did not reply to him in these words, because it is often the case that a letter is misunderstood, I would say to you gentlemen that it is a very good case to cite here.

Here is a case of a farm which has been under tenant control for 20 years. It is run down, and it grows very poor crops. The present owner thought that the small crops were due to an evident exhaustion of plant food. Now, his neighbor had his own soil and has cultivated his own soil for 20 years, and has continued to get very much larger crops by the use of better methods.

This new man who has taken up the farm thinks, as he is justified in thinking from the teaching of the past, that he must build up his soil by adding to it mineral plant foods.

Now, I would like to ask him, or I would like to ask you whether you think that is sufficient evidence to conclude that there was a small amount of plant food when the neighboring man, cultivating his own soil, has for 20 years grown larger crops? Would these smaller crops on this tenant farm remove more plant food than the larger crop of the other farm? Do you think that under the tenant system of cultivation if this man had removed no crops from his soil, but had plowed them all under as they matured from year to year, and had persisted in his method of soil control, he would the

next year, if he were going to harvest a crop, get as much as the neighbor who had been removing crops from his soil for 20 years under better methods? I think not. There is something wrong that has come from neglect, from improper control, so that the soil now does not function for the plant as the soil on the neighboring farm that has been kept in better condition.

Mr. Chairman, we have come to look upon the soil now as a sub-organic thing having functions. We are recognizing that there is a parallelism, there is a similarity in the functions of the soil to the functions in living forms. It must not be carried too far, but it can be used for illustrative purposes. The soil has an anatomy; it has material, it has texture, and it has structure. It also has nutrition; it also has a digestive system, and it has a circulatory system.

Now, these functions run along parallel lines to the functioning of the body or to the functioning of the animal or to the functioning of the plant. So that we have in the soil a complicated functional body and any one of these functional activities may become disordered.

Mr. CHAPMAN. When you apply fertilizers to the soil you perform the same functions that a doctor does in giving medicine to a sick body?

Dr. WHITNEY. Yes; we correct some of these functional activities.

Mr. HAWLEY. Might it not go further and be compared with when he prescribes a diet?

Dr. WHITNEY. Yes; when he prescribes a diet; when he prescribes exercise; when he prescribes change of food. We are looking upon the soil as requiring food, and the most important food of the soil is the plant and its remains. Rock powder does not function as a soil until it has food and until it has had a growing plant or plant remains. Then it takes on the functioning of the soil. It must have nutritious materials in the circulatory system; it must have the proper amount of nutritious materials; it must have enzymes; it must have bacteria and oxidizing power, and protozoa, that will digest the remains of these plants that have been growing upon it. It must have a digestive system in order to take care of the plant remains, and when you continue to grow the same crop year after year you get your soil incapable of producing just as you get your own bodies incapable of producing work if you have a continuous narrow diet yourself.

The CHAIRMAN. Some years ago you suggested that the reason you got poor crops after planting the same crop a number of years was that there was given off from the plant certain effluvia that poisoned the ground against that same plant, as the excretions of an animal would be poisonous to that animal?

Dr. WHITNEY. Yes.

The CHAIRMAN. Do you still hold to that?

Dr. WHITNEY. Oh, yes; we have the bodies. We have now caught the soil in the act of digestion and we have found the products of digestion and are trying to establish a series of digestive residual products from the time the organic matter goes in either from the root of the growing plant or from the dead part of the plant, until it finally gets down into the most permanent form, and in my opinion, although this can not be stated positively yet, in my opinion, the permanent form is the hydrocarbons that have the same properties as

our mineral oils and our coal that we find in occasional deposits. I think that appears to be the end product.

Mr. LEVER. It seems to me the practical question is when you have grown one crop on a piece of ground for many, many years and found that the yield gets less and less each year that you ought to find out whether the shorter yield was due to the fact that the plant had extracted the food from which it feeds from the soil, or whether the soil had reached a condition that it refused to give up this food.

Dr. WHITNEY. Well, now, we have a great many things that bear on that. In the first place let me tell you of one very simple laboratory test that we applied for that very thing. We grew wheat continuously on soil until it would practically grow wheat no longer. We crowded the wheat in and grew it until it was almost barren for wheat. Then we took the soil and put it layer by layer against an absorbing surface.

Now, if you lay that soil on filter paper, on porous paper, or if you put a layer of soil and then a layer of carbon black, which has no mineral matter in it at all (it is simply porous carbon), and leave it in contact for a day or two then carefully remove the soil again and put it back in your pot it will produce as good wheat as though no wheat had previously grown on it.

Mr. LEVER. Have you ever tried the experiment of taking this soil that refuses any more to grow wheat and plant another crop on it, to see whether the crop will grow?

Dr. WHITNEY. Oh, yes; other crops will grow where wheat fails.

Mr. LEVER. So that the conclusion seems to be you have exhausted the wheat food from the soil?

Dr. WHITNEY. Or we have put something in the soil that is prejudicial to wheat and not to other crops, and which we can absorb from the soil by an absorbing body.

Mr. LEVER. You have either poisoned the soil or you have exhausted the food that feeds a certain plant; is that the idea.

Dr. WHITNEY. Yes. Well, we can not have exhausted the soil of food that feeds the plant, because the absorbing substances that we put in contact with the soil do not add anything to the soil, but we know that it does extract things from the soil and we have found the bodies that it extracts. And those organic bodies which are absorbed by the filter paper or the porous material, when we put it into another soil, poison the soil and wheat can not grow.

Mr. LEVER. Have you been able to find out what these things are which you extract by chemical analysis?

Dr. WHITNEY. Oh, yes. We have plenty of them. Now, Mr. Chairman, it does not seem a very big thing to tell the Committee on Agriculture that we have isolated 20 organic compounds. But they are the first that have ever been isolated in all the history of soil investigations. They are the first organic bodies that have been obtained in pure crystalline form.

Mr. LEVER. In the matter of crop rotation, the rotation of the crops tends to take out of the soil the poisonous things that refused to let the other plant grow to its full extent?

Dr. WHITNEY. When we grow wheat on a soil and immediately want to put in another crop, if we put in a cowpea, why the cowpea grows better after the wheat than it would before the wheat. The wheat itself would have grown poorer after wheat; but the cowpea

grows better. After the cowpea has grown our tests for the substances that operated to prevent the growth of the wheat failed to show the presence of as much or any of the material, so that the cowpea itself has destroyed the body that was injurious to wheat and has benefited by it, because in destroying that it has itself made an increased growth.

Mr. LEVER. In other words, that which poisons wheat makes good food for the cowpea?

Dr. WHITNEY. In certain cases.

The CHAIRMAN. Do you find that continuous growing of cowpeas in the same soil will result in lesser and lesser yields?

Dr. WHITNEY. Oh, yes; the cowpeas are just as sensitive.

The CHAIRMAN. Then, when you analyze the soil which, for the sake of brevity, we will say has been poisoned by wheat, and then isolate certain organic compounds which you think are the poison, then when you analyze soil which has been poisoned by cowpeas and isolate the organic substances which you think constitute that poison, are those two substances the same?

Dr. WHITNEY. No; they are different.

The CHAIRMAN. Are they the same for any two plants, so far as your investigations show?

Dr. WHITNEY. I could hardly state. We have not information enough.

The CHAIRMAN. If they were the same, would not that be an indication to you of the crops which should not follow one another? For instance, if the organic compound which poisons the soil against wheat was identical with the organic compound which poisoned oats, would that not be pretty good evidence you ought not to follow wheat with oats?

Dr. WHITNEY. Yes; if we can establish principles of that kind; but we have not enough information yet to enable me to say whether it can be done or not.

The CHAIRMAN. Did I understand you to say that these 20 organic substances which you have isolated for the first time are the substances which in your judgment constitute the poison against wheat or other plants?

Dr. WHITNEY. Not at all. They are not all harmful to plants. Some of them are beneficial. Some of them are harmful to some plants and some are beneficial to some plants. Some that are harmful to certain plants are beneficial to others. They are not by any means all harmful to any given plant. Just what part they play in the economy of the crop we have not yet been able to work out. It is lack of time, gentlemen. It is opening up a great field of possible economic results; we can not go too far in such work.

The CHAIRMAN. Was your office the original discoverer of these 20 compounds?

Dr. WHITNEY. Yes; we have discovered them ourselves in soils.

Mr. LEVER. In connection with these scientific experiments you are making along these lines would it not be well for you to make some practical demonstration of them, so that you could get your information to the people within a shorter time in a practical way, in a general way?

Dr. WHITNEY. I think it would. But, gentlemen, that brings me to a point I would like to emphasize, namely, that the troubles which

come from these substances probably play a very small part in the troubles that the farmers are encountering. By far the largest part of the troubles of the farmer are due to a lack of proper adaptation of the soil to the crop. They do not know what crop can be grown on these different types of soils.

Mr. LEVER. That is, in the fertilizer belt, the adaptation of fertilizer to the crop and the soils differs.

Dr. WHITNEY. The adaptation of the fertilizer to the crop; and at least 90 per cent of the troubles that come to us through the mail, and that we meet with in our field experience, can be determined by a field diagnosis. One of our trained men can tell the trouble with the soil in the field, and the amount of laboratory confirmation is very small. It is taking, with us, the same direction that medicine has for so long taken. We are giving more and more attention to field symptoms and diagnosing the trouble by the evidences presented by the soil in the field; and in 90 per cent of the cases the cause and the remedy would be told by field inspection.

Mr. HAWLEY. In what way does the mechanical treatment of soil have relation to these matters you have just mentioned?

Dr. WHITNEY. It is very important. In case of drainage where a soil is not well drained, no laboratory confirmation is needed for that. The field diagnosis is sufficient to determine this trouble. There is no use of asking us for fertilizer formulæ when the obvious thing is the lack of drainage. If the soil has been poorly selected or a crop has been selected that is poorly adapted to that soil, there is no use of any confirmatory test for that. We could tell them at once that "You should never have used that soil for that particular crop. There is a natural difference in functioning; there is a natural peculiarity that is associated with that soil that in our experience makes it unfit for the use or the purpose that you have in mind." For example, in the Georgia peach district the Orangeburg soils are the soils that they get their fine peaches from in certain localities. With the Susquehanna soils in adjoining areas, in adjoining fields, you can not grow peaches with success.

Now, that is just as firmly fixed as that you can not expect our laboring men to do a high quality of mental work. That is fixed. There is a difference there that is unbridgable.

Mr. McLAUGHLIN. You think that is all due to the soil? Some information has come to us to the effect that in one orchard where the soil all over it is the same, that different kinds of apples or the apples of one variety will grow differently on one spot from another, due to the difference in the air drainage and the underdrainage and all that.

Dr. WHITNEY. Oh, yes.

Mr. McLAUGHLIN. The soil may be exactly the same.

Dr. WHITNEY. Well, if there is any difference in the underdrainage the soil will function differently. It is bound to do so.

The CHAIRMAN. A statement was made here yesterday by Dr. Wiley, which interested the committee a good deal, to the effect that wheat grown in Kansas which showed a content of about from 18 to 22 per cent of gluten, when taken to California and planted, produced wheat which yielded only about 11 per cent of gluten. Would you consider that difference in the glutenous content to be due primarily to the difference in the soil?

Dr. WHITNEY. I think not. It would function differently under those different climatic conditions, and the soils would function just as differently under different climatic conditions.

The CHAIRMAN. I notice on the map you brought with you that you have conducted a reconnoissance survey over the western part of Kansas. Have you, as a result of that survey been able to make any suggestion to the people who are living there, looking to the production of crops which they have not themselves discovered could be successfully grown?

Dr. WHITNEY. I can not tell you because the work has just been finished. The man in charge of the work has just reached Washington, and I have not had a chance to talk with him yet.

The CHAIRMAN. Speaking about the reconnoissance work generally in that belt which has now been going on I believe for the third year, have you made any discoveries which have been of practical value to the people?

Dr. WHITNEY. Oh, yes; we are showing the general location and extent of the different soils, not with as much detail as we do in the east, but in a general way; and in that country the soils are uniform over large areas, and we are showing those with sufficient detail for their use.

The CHAIRMAN. Are you showing them that they can grow crops which they have not heretofore tried?

Dr. WHITNEY. Oh, yes; and we are showing them where they can expect to grow wheat and where they need not expect to grow wheat; where they can grow beets or alfalfa, and where they should not expect to succeed with those crops. The whole problem of the development of agriculture in the semiarid region, is a soil problem, the amount of water that is held by the soils, the physical properties of the soils, as a rule.

Mr. LEVER. Can you show those things without experiment and actual growing of the crops?

Dr. WHITNEY. Yes; we can tell them of it. Of course we can not show it, but we can tell it.

Mr. LEVER. And can you be certain you are telling them correctly?

Dr. WHITNEY. Oh, yes. Of course I should like very much sometime to use the men who have obtained the experience of 6, 8, or 10 years in the soil survey and give them the opportunity of going out and teaching in more specific terms; but we have not been able to do that yet, and I have held them right down to the soil survey work.

The CHAIRMAN. Are there any further questions the members of the committee desire to ask the doctor in a general way?

Mr. CHAPMAN. I see in Illinois you have these surveys in nine counties. Is it the intention to survey the different kinds of soils in the States? I notice that they extend from the north to the south part of the State.

Dr. WHITNEY. Yes.

Mr. CHAPMAN. The intention was to cover all the different classes in that particular State?

Dr. WHITNEY. Yes.

Mr. CHAPMAN. There are no surveys in progress in that State now, are there?

Dr. WHITNEY. We have none just now. Our work is in the Southern States during this season.

Mr. STANLEY. What work of that kind is in progress in Kentucky?

Dr. WHITNEY. We have nothing at this time in Kentucky. We had an area last year; we have just finished an area in Kentucky.

Mr. BEALL. How about Texas; what are you doing there?

Dr. WHITNEY. In Texas we are working in Harrison County. Then we have the reconnoissance work in the south district.

Mr. BEALL. In the Panhandle?

Dr. WHITNEY. No; we have finished the Panhandle. The present work is in the south Texas district.

The CHAIRMAN. If there are no further questions relating to the general work of this bureau we will take up the question of the estimates in detail.

I notice first on page 57 a request that the salary of the chief of the bureau be increased. How long has the salary been \$3,500, doctor?

Dr. WHITNEY. I should say for eight years.

The CHAIRMAN. Assuming that the doctor would rather have that matter presented by the Secretary than to present it himself, we will pass it at this time.

It appears that on your statutory roll, aside from the transfers from the lump sum, there are recommended five new places—one clerk of each of the four classes and one draftsman. Is there anything that you wish especially to say in regard to that increase?

Dr. WHITNEY. Nothing further than to say that the work of the bureau has grown very much and our clerical force is too small to handle it. We need strengthening all along the line. We have in accordance with, I think, the wishes of the committee, or the chairman of the committee, gone rather extensively into cooperative work with the States. They have given us about \$50,000, and that has increased the amount of our clerical work very materially.

The CHAIRMAN. Are any of your clerks obliged to work overtime?

Dr. WHITNEY. We occasionally have to have them work overtime.

The CHAIRMAN. Are they materially behind with the work now?

Dr. WHITNEY. We are behind in our drafting work, some months behind in that.

The CHAIRMAN. How about your ordinary routine clerical work; is it current?

Dr. WHITNEY. Yes; it is practically so. It is growing, however, more and more, so that it is getting more and more difficult for us to get stenographers and typewriters and get accounts out promptly when they are called for, and we are very well crowded up, congested.

The CHAIRMAN. Do you give any personal attention to the work of your ordinary clerks so as to have a judgment of your own as to whether they are doing as much work as they might reasonably be expected to do?

Dr. WHITNEY. Why, I see the work in a general way. Of course it is under the charge of the other men in the bureau, the chief clerk and the division chiefs, but in a general way I think our men work as hard or harder and fully as much work is turned out as Government clerks ordinarily produce.

The CHAIRMAN. Do you happen to remember whether there have been any separations from the service through inefficiency during the past year?

Dr. WHITNEY. There have been some transfers that I did not oppose.

The CHAIRMAN. That is putting it very gently and diplomatically. I presume you maintain efficiency records so that somebody's judgment as to the efficiency of each clerk comes before you once or twice a year?

Dr. WHITNEY. Oh, yes. I get the record that is kept. I am trying to bring it down in the case of our field men to a question of efficiency of our soil survey work; the amount of work done, the cost per square mile, and the character; but it is somewhat difficult. It is going to take us some time to work that out.

The CHAIRMAN. But taking your clerical force, does your experience as the chief of the bureau lead you to believe that it would be practicable to establish a certain standard of efficiency, with the distinct understanding that any clerk who fell below that standard for any considerable length of time should be removed?

Dr. WHITNEY. Well, in a general way, yes; but there has always got to be discretion and judgment, because of the varied character of the work that comes to them. We have not in our bureau a large force; we have a few clerks that do nothing but take letters, take dictation. We have some, though, that are making up statements for Congress. That is a different kind of work from the ordinary clerical work. We have some that are concerned entirely with the handling of the data in connection with the soil surveys, the records of the soils in the areas, the measuring of maps, and keeping our various records of that kind. Then there are some of our clerks who take the manuscripts that are sent in from the field men and go over and digest them and get them in proper shape. There are some that are preparing material for the use of the field men, because they can not consult libraries. I have a clerk that is gathering material for their use in the preparation of their reports.

Now, it is very difficult to compare the amount of work done on such different lines as those.

The CHAIRMAN. I can realize that. But take your stenographers, for example. You said you were overcrowded in working along that line. I have wondered if your experience has been something like mine. I have had stenographers who worked hard all day to get out 10 or 12 letters; and I have had other stenographers who could get out 50 or 60 letters during the same length of time.

Dr. WHITNEY. I think, Mr. Chairman, that on the whole the force of the bureau is a very able force of men. Of course they are not all equally strong; they are not all equally effective.

The CHAIRMAN. I notice that you transfer from the lump fund one place which you designate as publicity agent, at a salary of \$1,800. Who fills that place and what are his duties?

Dr. WHITNEY. Mr. John R. Bowie at present occupies that place. He is what I might call my right-hand man for giving out material that will be of interest to the papers. His principal work is in connection with the soil survey. He prepares, first of all, a statement showing that we are going to take up a soil survey in such and such

a county, in Georgia, for instance. That statement goes out to the local papers.

I had a case some time ago of a soil-survey party we were sending into South Carolina. After they had been there for three or four weeks some prominent man wrote up and said, "When is that party coming into the State; we have been waiting for it; the commercial club has been expecting it, and they want to see them." As a matter of fact, they had been there for a month, and the news had not got to these people. So we are preparing now statements for the local press, and they are worded in newspaper language, not as I would write to you, but as the papers want it, stating that a soil-survey party has been authorized by the Secretary and that the work will be begun at a certain time. That gives the papers a certain amount of information regarding the work of the bureau that is very essential.

The CHAIRMAN. How long have you maintained such a place as this?

Dr. WHITNEY. From memory only, I should say about two years; perhaps longer.

The CHAIRMAN. Do you think that the activity of your publicity agent has anything to do with the numerous demands that are made upon your bureau for work?

Dr. WHITNEY. Oh, I think not. It is to furnish information, and I have been very careful about these accounts. They are all seen by me and I have to certify to them; then they go to the Chief of the Division of Publication and by him are sent to the Secretary.

The CHAIRMAN. Does he issue bulletins regularly?

Dr. WHITNEY. Press notices only.

The CHAIRMAN. Are those press notices sent out broadcast?

Dr. WHITNEY. No, sir; they are sent to the localities that are particularly interested. We notify the papers when the field work is started, when it is finished, and then when the work is completed ready for issuance we give a summary and details of it in newspaper style, and they are very generally used. We have a very large number of newspaper notices that are sent to us by the press agencies, showing that this work is very generally used and appreciated.

The CHAIRMAN. Do you maintain a clipping bureau, or do you patronize a clipping bureau?

Dr. WHITNEY. Yes.

The CHAIRMAN. That sends to you everything pertaining to the bureau?

Dr. WHITNEY. About soil investigations. Not only of our own work, but any other work in the country.

The CHAIRMAN. Among other things, this bureau is expected to send you a clipping of everything sent out from this bureau which is printed anywhere?

Dr. WHITNEY. Well, we rather expect them to. As a matter of fact they do not, because our service is very largely to the small papers. For instance, if we have an area in Georgia, we send to the papers in that county and to the Atlanta papers, or to the city papers that circulate in this region. We do not send it out to the Associated Press papers, and the clipping bureau gives us only practically the Associated Press service.

The CHAIRMAN. Does it not occur to you that the enterprise of local papers, together with the natural interest which the representative of the district in which the survey is made would have in circulating news, could be depended on to give all the information the people called for?

Dr. WHITNEY. We have to be careful that we do not overlook that point and fail to give it out. We have had a good deal of trouble in that because before we had someone to look after these points, why they were overlooked—the points were overlooked.

The CHAIRMAN. What points did you overlook?

Dr. WHITNEY. We did not send information out that we were going to send a party there; they did not know it.

The CHAIRMAN. What difference did it make when your party got there and did its work and your report was published? That report went into the hands of the Representative of the district?

Dr. WHITNEY. Yes.

The CHAIRMAN. Undoubtedly the first thing he would do would be to send copies of the report to every newspaper in his district.

Dr. WHITNEY. Yes.

The CHAIRMAN. And then he would send copies to such a mailing list as he thinks would be especially interested in it. Is not that about all that could be accomplished in any way?

Dr. WHITNEY. On the contrary, we find that the interest of the locality is centered in this work as it proceeds. The papers want to give for the information of their people notices from time to time that the work has been started, that it is in progress, or that it is finished, and finally the results of the work.

Now they do not use the bulletin or the advance sheets that the Representative sends out. They would infinitely prefer to have us get that material out for them.

The CHAIRMAN. That is purely a matter of inertia on the part of the editor. If he knows that he will get a summary of this sheet which he can simply hang on the hook and run in without any effort on his own part, of course he will wait for it. But if he knows, on the other hand, that such a summary is not coming, would not the average editor go through this report and cut out what seemed to be the salient features of it, and write his own article?

Dr. WHITNEY. We find we get more efficient service by giving them something they can put in. They will not take the trouble; they do not know how. With our man, he knows just what they want; he has studied that subject. He knows just what part of our reports will appeal to the man who reads the newspapers.

The CHAIRMAN. How many of these reports does he write in a week, would you say—different reports?

Dr. WHITNEY. I would hardly like to say. It depends on the stage of the work; it depends on the time of the year. We have had a good many of them coming out recently, because we are changing our parties. We have had areas that have been completed and we have areas that are being started.

The CHAIRMAN. How many areas are you at work upon in your busiest season?

Dr. WHITNEY. Well, we have had 59. Last year we have worked in 59 areas.

The CHAIRMAN. Did it take all the time of one man for one year to keep track in a news way of these 59 areas?

Dr. WHITNEY. Well, he is keeping track of the work in the bureau; he is keeping track of the different stages. He puts out an average of at least four notices. He studies that work and keeps them informed of the progress and finally of any important things that are developed.

The CHAIRMAN. Has this man been in the bureau a longer time than the office has existed?

Dr. WHITNEY. No.

The CHAIRMAN. You brought him in for that particular purpose?

Dr. WHITNEY. Yes, sir; I brought him in for that purpose. He was a newspaper man. He has had newspaper training for many years and has put out very good notices of our work.

Mr. BEALL. Is his work confined to the character of notices of which you have spoken, or does he give the country the benefit of information in regard to the general work being done by the department?

Dr. WHITNEY. He is giving them information of our general work, of our laboratory work. He is putting out some of these scientific results and conclusions that we have reached. We have found the papers will take them and have taken them. It seems to me a very efficient service and a very good way of putting out information. That is one of the duties of the department, to disseminate information, and I really do not know of any better way to get it out before the people.

Mr. McLAUGHLIN. I can see how he might gather from one of the reports of the agents in the field the salient features of the report and that it would be of interest to the people; but I do not see how material it is to tell people in the country when your man is coming. He does his work; he goes there and does it himself, in his own way, and I do not see how it could help them or be material at all whether they know he is there or not.

Dr. WHITNEY. It makes much difference. In an area in which we worked in one of the Northern States, it was reported to me in very strong language that the man we sent up there had not consulted with the members of the board of trade, and charges were almost made against the man for presuming to go into the State without consulting with the members of the board that had been instrumental in getting this survey.

They want to see the men, they want to talk with them. They want to have him visit their farms. They want to get information from our men as the work is proceeding.

Mr. LAMB. A member of Congress is the first to ask for these surveys, is he not? Do you respond to requests of the Members of Congress for surveys?

Dr. WHITNEY. Well, they come from many sources. We listen to Members of Congress when they ask, but we have requests from other sources.

The CHAIRMAN. Would not that difficulty be met by simply instructing your field men when they go out and enter a county to make a survey, to report to the newspapers as a matter of news the fact that they are there, so that it might be made public?

Dr. WHITNEY. In some cases that is done, and it used to be done. I used to try to impress them with the necessity of doing that, but we have got to be very careful in letting our men give out interviews in the field, and I have issued orders that all such interviews be sent back here and viséed by our publicity agent to see that nothing goes out against the policy of the department.

The CHAIRMAN. Would not the trouble you are taking to notify everybody you are coming there simply accentuate the difficulty along that line? Would they not be harassed all the more to give out interviews?

Dr. WHITNEY. We find not; that they are more satisfied with the procedure we have instituted than they were with the old system.

The CHAIRMAN. If they are simply notified of this through the newspapers by means of an article written here to the department that a certain party will visit the county for the purpose of making a survey, they are content with that, and they leave the party alone, do they?

Dr. WHITNEY. They leave the party alone. It is that information that they want, and they do not expect to get information from them except in a personal way as they drive around and see their own farms. They do not expect to get information regarding the survey until they have practically completed the area. But they are glad to talk with them. They want to meet them. They want to talk with them personally, but they do not expect any newspaper publication after that until the report is issued.

The CHAIRMAN. The only publication I had reference to, of course, was the mere fact that they were there to do that work.

Dr. WHITNEY. Yes.

The CHAIRMAN. That it would be done in certain places, that it would continue for a certain time, that it would be finished at a certain time, and that the report probably would be issued at a certain time.

Dr. WHITNEY. Yes.

The CHAIRMAN. That is an interview even the most undiplomatic field agent ought to be able to give without embarrassing the department, I should think.

Dr. WHITNEY. Our service is rather more extensive than would be possible under that system, because we have in the newspaper directory a list of all papers in that locality, and not only in that immediate locality, but of the daily papers that reach the locality. As I say, in Georgia we would send not only to papers in this county and in surrounding counties in that district, in that territory, but also to the city papers that are taken in that part of the country.

The CHAIRMAN. When you circularize a given district in this way, do you notice as an immediate result an increase in the number of demands from that district for additional work?

Dr. WHITNEY. No.

The CHAIRMAN. You do not think it has a stimulating effect that way?

Dr. WHITNEY. I have not noticed that at all. Our requests are pretty steady. I should say we have about 800 petitions on file. I do not notice any specific influence from this publicity work in increasing the demand for soil surveys.

The CHAIRMAN. I would be glad if you would send me up a sample lot of these publications that are issued from this publicity bureau

Dr. WHITNEY. I will.

Mr. McLAUGHLIN. As to the manner in which the man in the field does his work, when one of your men goes out into a county to make his examination and requests are made to him by owners of land and farmers and so on for an examination of their lands, is he expected to comply with all those requests and to make the examination?

Dr. WHITNEY. No.

Mr. McLAUGHLIN. He makes such examinations as he thinks necessary to give an idea of the entire county?

Dr. WHITNEY. Yes.

Mr. McLAUGHLIN. Then what good does it do to have these land-owners and farmers informed of the coming of the agent, so that they can meet him and talk with him, and so on, as you have suggested?

Dr. WHITNEY. It is just as valuable to us to get in touch with the resident and intelligent farmers of a locality and get information from them that may guide us in our work in regard to the past history, the practices that have prevailed, as it is for them to get in touch with us. I do not at all object to, but rather encourage, the meeting of our men with the prominent men of the locality with the good farmers of the locality, because in their conferences they bring out information that is as valuable to us as our information is to them. We gain a great deal more by meeting people than we would if we conducted the survey quietly without their knowledge. I feel we are able to do them good, and I know they are able to do us good, because the farmers' facts are very accurate. Their deductions are often faulty, but their facts are very accurate.

Mr. HAWLEY. Does this publicity agent do any work other than you have described?

Dr. WHITNEY. No; he just studies the work, the method of presenting it to the public.

The CHAIRMAN. I presume you have only one publicity agent?

Dr. WHITNEY. Only one.

The CHAIRMAN. So that where the place appears on page 59 under the head of "administrative expenses" the reference is made to the same man?

Dr. WHITNEY. To the same man; yes.

The CHAIRMAN. And that is also true in regard to "one soil bibliographer?"

Dr. WHITNEY. That is true.

The CHAIRMAN. What is the duty of the bibliographer?

Dr. WHITNEY. He watches the literature for us of scientific publications, and cuts out for our use a complete reference not only to the title of the scientific papers that are published from time to time, but abstracts their substance, and he gives it to us, as they appear in the Russian, Italian, Spanish and Japanese papers, if we are fortunate enough to get a man that understands that language; but we require a knowledge of many languages so that we can keep up with the work that is being done in all countries.

The CHAIRMAN. Is the man you have now familiar with several languages?

Dr. WHITNEY. The man we have had, I think, was familiar with ten or twelve languages. He has just been taken up by one of the other

bureaus because he was considered too important a man for bibliographic work, and he has been given a more important work, I believe. We are looking now for another man to take his place and are trying to get a man for this same salary.

Mr. LAMB. Do you get him from the commission?

Dr. WHITNEY. Through the Civil Service Commission; yes, sir.

The CHAIRMAN. If there are no further questions on this subject we will pass from the statutory rolls to general expenses. The first paragraph provides for an apparent increase of \$35,000. Do you know what the actual increase is in that appropriation?

Dr. WHITNEY. The actual increase is \$5,000 for the laboratories and \$35,000 for the soil survey. This is the net increase.

The CHAIRMAN. The first paragraph under the head of general expenses is "for the investigation of the relation of soils to climates," and so forth; that is what you call your laboratory funds?

Dr. WHITNEY. Laboratory funds, yes. That has been increased \$5,000.

The CHAIRMAN. There is no increase in the item "For the investigation of the relation of soils to drainage and seepage waters?"

Dr. WHITNEY. No increase in that.

The CHAIRMAN. Is there necessity for as much as you have? Are you carrying on any work under that heading that you consider important?

Dr. WHITNEY. Yes; we are using that, but at present the requirements of that work do not make it as necessary for me to ask for an increase there as in these other lines.

The CHAIRMAN. Where are you doing any work under that paragraph—in the field or in the laboratory?

Dr. WHITNEY. It is largely in the field, during the field seasons, so far as we can get out.

The CHAIRMAN. Where did you do work during the past summer?

Dr. WHITNEY. During the past year we worked in Mississippi, in the Southern States particularly, and in the Great Plains region; in Colorado, Kansas, and neighboring States; and also in California.

The CHAIRMAN. State briefly just what do you do in that line of research?

Dr. WHITNEY. I gave a paragraph or two in my opening statement about that. In the first place, the matter of erosion—that is, the control of surface waters to prevent destruction of the soil. In the second place, the study of underground waters, and the influence on soil from them.

The CHAIRMAN. That is sufficient.

The next paragraph is that under which you carry your general soil-survey work, I believe, "For the investigation of soils, and for indicating upon maps and plats, by coloring or otherwise, the results of such investigations." In that paragraph you ask an increase of \$35,000?

Dr. WHITNEY. Yes.

The CHAIRMAN. How many surveying parties did you put in the field this year?

Dr. WHITNEY. I should say that we had between 20 and 30 parties.

Mr. LAMB. You send them in twos, in pairs?

Dr. WHITNEY. Yes, except where we cooperate with the States and they send one and we send one. We have now, I think, 20 areas under way.

The CHAIRMAN. Under the head of "Administrative expenses" there appears to be an increase of \$1,500?

Dr. WHITNEY. Yes. We were a little short. We transferred some of our funds last year to the shop, and we find that we were a little bit short of the funds for the general miscellaneous expenses of the bureau. It seemed advisable to get a little bit more.

The CHAIRMAN. I would like to direct your attention to the salaries noted at the bottom of page 59, "One scientist in soils, laboratory investigations." Who is that?

Dr. WHITNEY. That is Dr. Cameron, in charge of the chemical and physical work.

The CHAIRMAN. Is there any place there which has been created during the past year?

Dr. WHITNEY. No; not within my recollection.

The CHAIRMAN. The scientific force which you have now is the same as that you have had for several years?

Dr. WHITNEY. Yes, sir; with changes in personnel due to resignations and necessary promotions.

The CHAIRMAN. I presume you could give me the names of each of these men?

Dr. WHITNEY. Why, I think so.

The CHAIRMAN. I will not detain you to do it now.

Dr. WHITNEY. I can, of course, if you want a list.

The CHAIRMAN. Who is the expert under the head of "Soil-water investigation?"

Dr. WHITNEY. Dr. W J McGee.

The CHAIRMAN. What has he been doing this year?

Dr. WHITNEY. He has been out in the field, in Kansas, Colorado, and out on the Pacific coast in connection with our reconnoissance soil survey and carrying on investigations in Mississippi and other Southern States.

The CHAIRMAN. Has he published anything?

Dr. WHITNEY. He has submitted matter for publication. He has published Yearbook and other articles. He has a bulletin now in hand that has not yet been issued.

The CHAIRMAN. Have you read it?

Dr. WHITNEY. I have read it.

The CHAIRMAN. What does it treat of?

Dr. WHITNEY. It treats of the principles of soil erosion and soil water; its relation to the properties of soil itself.

The CHAIRMAN. Have you submitted it for publication?

Dr. WHITNEY. I have.

Mr. LAMB. How long have you been carrying on this soil-water investigation?

Dr. WHITNEY. I should say three or four years.

The CHAIRMAN. This Mr. McGee was the first and has been the only man to hold this position?

Dr. WHITNEY. Yes; except, of course, we have always on our laboratory side, in our physical investigations, concerned ourselves with the scientific laboratory studies of soil water, but not with the field studies on so extensive a scale.

The CHAIRMAN. What was Mr. McGee's preparation for this work?

Dr. WHITNEY. He has had a very broad experience. He was connected for many years with the Geological Survey and had given attention to physiography, contours, and erosion. As long as 20 years ago he was an authority on the subject of soil erosion.

The CHAIRMAN. Are there any further questions that members of the committee desire to ask Dr. Whitney? If not, and the doctor has nothing to volunteer, we will not detain him any longer. We are obliged to him for attending.

(Thereupon, at 12.20 o'clock, the committee took a recess until 2 o'clock for the purpose of considering another matter.)

ATFERNNOON SESSION.

The committee reconvened, pursuant to the taking of recess, at 2 o'clock p. m.

STATEMENT OF HON. T. W. BRADLEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK.

The CHAIRMAN. The gentlemen of the committee will remember that Representative Bradley, of New York, asked to be heard when the Bureau of Soil Survey was before the committee. He was unable to attend this morning, but he is here now, and with the consent of the committee I would like to interrupt this hearing for just a few minutes so that he can make his statement and not wait all afternoon, and then it can be put into the record in connection with Dr. Whitney's statement.

Mr. BRADLEY. Mr. Chairman and gentlemen of the committee, there is very little that I care to say. In this period of keen interest in the high cost of living, the farmers in my section of the State of New York, which is along the eastern end of the southern tier, the counties of Orange, Sullivan, Rockland, and Delaware, are eagerly desirous of soil survey. Little of this work, comparatively, has been done in the State of New York, although the farmers, especially through the granges, Patrons of Husbandry of the counties, have, during the past eight or nine years, repeatedly asked for it. The condition has been such that the Bureau of Soils has not had sufficient appropriation to devote much attention to that section of our country, and perhaps the Representatives from New York have not been as urgent as they should have been.

This matter of soil survey was again brought to my attention last year by the combined 22 granges of my county, who really feel grieved that their petitions, having been on file for so many years with the Bureau of Soils, should receive no attention whatever, while other States, notably the South, should receive a much larger proportion of attention and work in soil survey than our Eastern States. That, however, is all right, because the South needed it, and the South has benefited wonderfully. The farmers in my section, devoted almost entirely to dairy work, the producing of milk for the New York City market, as they have been for nearly 40 years, believe their

lands should have a rest, in part, from the constant cutting of hay; that their system should change somewhat from large herds supported to a considerable degree on purchased feed, and are desirous of going into something else, in part, so as to help out a condition that for years has not been profitable to them. Before entering on any change, they rightfully feel they should first have a soil survey, so as to better learn what crops to adapt to the soil.

Mr. McLAUGHLIN. Is it your experience that the more stock you put on a farm the more it is likely to become impoverished?

Mr. BRADLEY. No; I will not say that. I will say the dairy farmer may not do so well because he must buy expensive feed. But you will pardon me if I rather decline to answer questions regarding the details of farming. I am not qualified to do so. But, as a business man, a manufacturer, and banker, living in that section all my life, I have a general common-sense business knowledge of the needs of my farmers there. I believe that soil survey is the important thing they need to-day. They say so. They have been waiting long for it. It is a matter of appropriation, and I have come to you to express the want of that portion of the State of New York, and to hope the committee will deal generously with the estimates of the Secretary of Agriculture, so that in New York we may be more liberally treated in this matter of soil survey than we have been in the past. In the State of New York within the past 30 years farm values have depreciated something like \$150,000,000; in Alabama they have appreciated within that time \$130,000,000, if I remember rightly, and soil surveys have had a great deal to do with the advancement of the State of Alabama. I think it will help our people; in fact, I know it will. The matter has been well investigated there by the Chief of the Bureau of Soils and other officials of the Department of Agriculture, and we are now right down to the business proposition that we need the money to do the work; and I feel warranted in urging upon this committee the necessity of granting the full amount requested by the honorable Secretary.

To be fair about it, we are going, in my part of the State, to our legislature and ask the State to bear a part of this burden through our agricultural college at Ithaca contributing in connection with and under the advice and control of the Bureau of Soils.

The CHAIRMAN. I should like to suggest, Colonel, that one reason given by the department for having been so generous with the soil surveys in the South has been that they have met with a cordial spirit of cooperation. So that I am glad to know that your people are going to the legislature for part of the funds.

Mr. BRADLEY. I will admit that the State of New York has not been so generous in the matter of contributing to soil-survey work as have some of the Southern States in assisting the Bureau of Soils; but we have now reached the point where we are going to be so in this particular.

Mr. COCKS. However, you will admit that New York has been as generous as any other State in aids to agriculture generally?

Mr. BRADLEY. I will; and I think the State of New York, considering its position among the States, has asked comparatively less of Congress than other States. But the time has come when our people need more help from the United States Department of Agriculture.

STATEMENT OF MR. EUGENE GRUBB, OF COLORADO.

The CHAIRMAN. Before taking up the consideration of the estimates in the regular order this afternoon, I will ask the committee to listen for a few moments to a statement which will be made by Mr. Eugene Grubb, of Colorado. Mr. Grubb has had long and successful experience as a potato grower, has made a scientific study of the best methods of the culture of and diseases that affect potatoes, and was sent abroad by the Secretary of Agriculture some seven or eight months ago as a special commissioner from the department to look into the question of the diseases of potatoes in other countries from which shipments are made to the United States. He has made a careful study of this subject in England and in various European countries, and has obtained information which he considers of great importance. In view of the fact that the committee is considering a bill which would, perhaps, if properly worded, cover the subject of legislation which Mr. Grubb will recommend, in case the committee should conclude that legislation is desirable, it seems as if this were the best time to consider the subject, and I will therefore ask Mr. Grubb to make whatever statement he desires to make to the committee.

MR. GRUBB. Mr. Chairman and gentlemen of the committee, I beg your pardon for correcting the chairman. I am not a scientist or a technically educated man. I went abroad and studied potato culture from the cultural or farmer's viewpoint, to improve the yield per acre, and the methods of the American potato grower, by appointment of Secretary Wilson. One of the very first propositions before I got into a single field over there was in the British agricultural department, where I found what was very new to me, a disease known by various names as black scab, or wart disease, very infectious and very damaging to the industry. It could wipe it out of existence, if permitted to go on. I found that the Department of Agriculture of Great Britain, dealers, shippers, exporters and growers are not very free with information as regards the damage by this disease; that they have had it for several years, 10, 12, or 15, and they have never had any bad effects except in the gardens around the manufacturing centers where they are growing potatoes continually.

In one of the secretary's offices there is a map of Great Britain, and what attracted my attention was—I may diverge a little to show the extent of the disease over there—a map of Great Britain as large as that [indicating map on wall], with thousands of black-headed pins stuck all over it in groups. It looked like a shotgun target that some man had been trying the pattern of a shotgun on, and I inquired what that was, and he said that was the localities, districts, and farms where black scab was. And then he brought samples in jars and in baskets of the potatoes affected by it. The more I investigated that it appeared to me that something should be done immediately. I cabled the Secretary, asking him if he could not stop the importation of potatoes. I had never heard of it in America; it was the first I had known of it. He wrote me a letter at length that he had no authority of law to stop the importation of potatoes.

I found on going to the farms and to the agricultural colleges and experiment stations all over Great Britain, Germany, and eventually

Ireland that they regarded it as one of the worst menaces to the potato industry since the potato disease in the forties in Ireland, when they had such loss of life from lack of food. The worst feature of this is that when the soil is once infected with fungus it requires from six to eight years in grass or a treatment by chemicals to eradicate the fungus before it is safe to grow potatoes again. It is known over there as a "reportable" disease.

There are heavy penalties for anyone knowing the existence of it using the potatoes, shipping, or growing without reporting to the department. The Channel Islands three years ago called their little Parliament together expressly for the purpose of passing a law for the exclusion of potatoes from all countries. They take the same stand with it that they do with the live-stock contagious diseases. They have never had any disease of live stock of any kind, never a single case of tuberculosis has ever been known on the Channel Islands, and that has been the result of the prohibition of the importation of any live stock from any part of the world. I understand that Canada has passed such restrictions on the importation of potatoes from countries where they have the wart disease, and I learn since I have been here in Washington that last year the disease was brought into Massachusetts on potatoes imported from Europe; also that Newfoundland has the disease.

Mr. McLAUGHLIN. You say it appears in potatoes grown in Massachusetts?

Mr. GRUBB. Yes, sir. As a potato grower and representing the potato interests more especially of Colorado—and now I presume the Secretary regards me as a factor in the potato work of the country—I consider it of much importance that a bill should be passed immediately prohibiting the importation of potatoes from any country or district that has this disease.

Mr. LEVER. This is a defective potato?

Mr. GRUBB. I would prefer that Mr. Orton would answer that, the pathologist, as long as he is here.

Mr. LEVER. I do not want to interrupt you.

Mr. GRUBB. You can not interrupt me. I hope you will try to, because I am here to give you such information as I have, and I would rather discuss this with you if you prefer that as we go along.

Mr. McLAUGHLIN. When did this disease make its appearance in Massachusetts?

Mr. ORTON. It was brought in last year.

Mr. GRUBB. I thought you said they had stamped it out last year, and that your department was watching to destroy and stamp it out in case of its reappearance.

Mr. ORTON. The importation was one year ago.

Mr. McLAUGHLIN. The importation was in 1909?

Mr. GRUBB. Yes, sir.

Mr. McLAUGHLIN. From what country?

Mr. GRUBB. Do you know from what country, Mr. Orton?

Mr. ORTON. Principally from England. Some were from France.

Mr. McLAUGHLIN. Were you able to trace it directly to the country or district?

Mr. ORTON. Yes, sir; but I have not the records here. I could give you the place of origin of that shipment.

Mr. McLAUGHLIN. Were those potatoes brought over for use as seed, or for sale commercially?

Mr. ORTON. As seed.

Mr. McLAUGHLIN. In what part of Massachusetts did the disease appear?

Mr. ORTON. Near Raynham, in the southeastern part of the State.

Mr. McLAUGHLIN. How serious a case was it? How large an area did they infect?

Mr. ORTON. Very small; and probably all the diseased potatoes have been destroyed now. There has been no recurrence of the disease, so far as we know.

Mr. McLAUGHLIN. Did you publish the facts in that part of the State, in that section of the country?

Mr. ORTON. No; the facts have not been published. A general circular has been issued calling attention to the serious nature of the disease and the danger of its spread. But no mention was made of this introduction, because it appeared subsequent to the date of the publication of the circular.

Mr. McLAUGHLIN. Was that Circular No. 55?

Mr. ORTON. No. 52.

Mr. GRUBB. I would like to read just a small paragraph from the report of the committee on agriculture of the Channel Islands [reading]:

A disease of the potato, known as black scab, has of late years made its appearance in England, and latterly has spread into those countries from whence a small quantity of potatoes for seed and other purposes was imported to this island. The committee views with great satisfaction the measures taken by the local authorities to prevent the introduction of this disease into Jersey by having prohibited the importation of potatoes from the United Kingdom. It is a step the wisdom of which no one will question, as the peculiarity of the disease under notice is its rapid development in land under continuous potato culture. Moreover, the excrescent growths which it produces on the tubers destroy their marketable value, and its introduction into this island, where conditions appear to be ideal for its rapid growth and propagation, would spell ruin to local agriculture by destroying the staple crop of the island.

This is a leaf from the report of the department of agriculture of the Channel Islands.

Mr. McLAUGHLIN. Is this disease dangerous to the human family?

Mr. GRUBB. I do not believe it would be if anybody ever saw it. It is the most abhorrent looking thing.

Mr. McLAUGHLIN. I suppose sometimes potatoes can be diseased, infected, and the disease may really be present in the potato but not be noticed, it has not developed far enough, and in that case the potato might be eaten; is there danger in a case of that kind?

Mr. GRUBB. For a practical man like I am, I would not want to even take time to discuss it that far. I would not ever want it in the soils or in America, because if it is ever introduced into our soils or on our farms, unless it is stamped out, we will never be rid of it as long as this Government endures, any more than we will ever be rid of black leg, foot-and-mouth disease, tuberculosis, or any other contagious or infectious disease. There is no way to ever stamp it out. It would be impossible. The menace is even greater than our live-stock health, from the fact that the average farmer of America is always trying to evade laws made for his protection by smuggling live stock or getting cheap seed potatoes or getting novelties. For I think three years in the last ten years foreign potatoes have been on

sale at all Missouri River points, and the farmers from those districts regard them as a novelty, and purloin them and buy them and beg them and plant them. The gentleman on the left brought out the strongest point in this matter that I have ever thought of, that they would come in for commercial or food uses, and therefore the bills that have been introduced would scarcely protect them as coming in under nursery stock or plant diseases.

The CHAIRMAN. I presume this fungus does not travel in any other way except upon potatoes?

Mr. GRUBB. I would not know. The pathologist would know.

Mr. HAWLEY. Does it attack just the skin of the potato, or go inside?

Mr. GRUBB. This fungous disease decays and rots it and then has growths on it. This will give the members a better idea of the development of it than any talking will do [handing members document]. That is from the English bulletin.

The CHAIRMAN. The point I had in my mind when I asked my question was this: If the particular field in which potatoes were grown were abandoned for the cultivation of potatoes as soon as the presence of this disease was located there, would it not soon disappear?

Mr. GRUBB. It is claimed that it takes from six to eight years, by treatment, even, given by the British department of agriculture, by the use of germicides and disinfectants; but how a farmer would determine when this fungus was extinct or exhausted would be the great question.

The CHAIRMAN. Do you know whether it has been sufficiently severe in those parts of England and other countries where it prevails to materially reduce the usual crop of potatoes?

Mr. GRUBB. I have knowledge of that only from hearsay over there; that it practically destroys the whole crop when once the soil is thoroughly infected. But the spread and development of it has been rapid in the last two years. This year its spread and development has been many, many times as much as in all its history from its first knowledge or inception up until 1910. This year has been the most favorable for the spread and development of this disease owing to their long-continued rains, cloudy weather, and humid atmosphere.

The CHAIRMAN. Do you know what methods they are using to combat it?

Mr. GRUBB. They are trying to restrict the shipment of the potatoes from all those districts.

The CHAIRMAN. I mean in the countries where it prevails.

Mr. GRUBB. It is quarantined over there, as largely as possible.

The CHAIRMAN. That is not quite the information I am trying to get. What I am inquiring is, whether in the places where it prevails they are developing any method of control; whether they are following any plan to eradicate the disease which promises to be successful.

Mr. GRUBB. Not that I could learn of, only by the restriction of its shipment to other sections.

Mr. HAWLEY. Does the disease remain in the soil after the potatoes are dug?

Mr. GRUBB. From six to eight years. The demonstrator, the president of the Royal Institute Agricultural College of Dublin, said that Ireland has restricted it more than any other country; that if the

British department of agriculture had taken hold of this three or four years ago and not neglected it until it got a foothold they could have controlled it. But they neglected it so long. Simply because this disease for several years did not develop rapidly, they thought it did not amount to anything, but all at once it began to spread all over the Kingdom, and then through all the potato-growing countries of Europe. Great Britain is, I presume, no worse than Germany, Austria, Roumania, Holland, Belgium, and France. Especially all soils that are of a heavy or clayey nature are favorable to the development and retention of this fungus.

The CHAIRMAN. Do you know whether the disease has appeared in Nova Scotia of New Brunswick, or any of the British possessions?

Mr. GRUBB. It is so reported. I think Mr. Orton has knowledge of that that is absolutely reliable.

The CHAIRMAN. Have you anything further to suggest, Mr. Grubb?

Mr. GRUBB. Only this, that I understand that this bill has been coupled with a general bill for the quarantine of plants and nursery stock, and that this bill has been opposed by certain nurserymen who have been before you. My suggestion would be that this exclusion should be made at the earliest possible date. It is no hardship on any country or any district in the exportation of their potatoes to give evidence to the Secretary of Agriculture that the disease does not exist. It is not any harder on those communities or districts than our live-stock sanitary laws, and for that reason I would suggest, if I may be allowed to, that this be made an independent bill, free from incumbrances or objections from other crop interests or societies or trades or business interests; that is an emergency that demands for the welfare and protection of the American farmer immediate and absolute exclusion of potatoes until such times as these different countries or exporters or trades will furnish such evidence to the Department of Agriculture as is required in regard to infectious or contagious diseases of live stock relative to the nonoccurrence of the disease.

The CHAIRMAN. We are very much obliged to you, Mr. Grubb. It occurred to me that it might be well to have a ward or two in this immediate connection from the department, and I will therefore ask Mr. Orton, who has been making a specialty, I believe, of the diseases of potatoes, to make just a brief statement as to what he knows about this matter and what his suggestion would be.

STATEMENT OF MR. W. A. ORTON, IN CHARGE OF INVESTIGATIONS OF DISEASES OF COTTON AND TRUCK CROPS, DEPARTMENT OF AGRICULTURE.

Mr. ORTON. I am a pathologist in charge of the diseases of vegetable in the Bureau of Plant Industry. I appeared before this committee last year and made a statement covering this ground. This is substantially little to add to that statement, except what you have heard from Mr. Grubb, that the situation grows more serious as time advances.

The CHAIRMAN. Do you know where most of the potatoes imported into this country come from?

Mr. ORTON. I have understood that they come from Lincolnshire and adjacent counties in England, and from Scotland. We are

without definite information as to the points from which the principal shipments occur, or as to the occurrence of the disease in those countries from which our principal shipments come.

The CHAIRMAN. Do we get any quantity of potatoes from the Continent?

Mr. ORTON. In certain seasons we do. It depends upon market conditions. There is, every year, a small trade in seed potatoes, but that is of minor importance, for the reason that European varieties are not adapted to American conditions, and the importations of seed potatoes are largely of an experimental nature.

The CHAIRMAN. How about the importations from British America?

Mr. ORTON. No danger attaches at present from any importations excepting from Newfoundland. So far as we know the disease does not occur in Canada outside of Newfoundland, and the Canadian Government has quarantined against it, and is maintaining a very efficient inspection service for their protection.

The CHAIRMAN. That is to say, the Canadian Government is refusing permission for the exportation of potatoes from Newfoundland?

Mr. ORTON. Yes, sir; and they also prohibit the importation of potatoes into Canada from Europe.

The CHAIRMAN. They do not allow the potato growers of Newfoundland to ship their product outside of that island?

Mr. ORTON. Quite so.

Mr. COOKS. Would they prevent their shipment to points in the United States?

Mr. ORTON. No, sir.

The CHAIRMAN. Then you did not understand my question.

Mr. ORTON. I beg your pardon.

The CHAIRMAN. I asked you if the quarantine which you said the Canadian Government has established in relation to this matter would prevent potato growers in Newfoundland from shipping their product outside?

Mr. ORTON. I had in mind the Canadian Dominion. The law prevents shipment of potatoes from Newfoundland into the Dominion of Canada. It does not prevent the shipment of potatoes from Newfoundland to other points, as to this country.

The CHAIRMAN. They are strictly taking care of themselves?

Mr. HAWLEY. They are selling the disease, but not buying it.

The CHAIRMAN. That is the point.

Mr. ORTON. We have records of five shipments in a single season from Newfoundland into Massachusetts. We have the names of those parties who have received the potatoes, but, so far as we know, that has not resulted in the establishment of the disease in this country.

The CHAIRMAN. You did not have any particular difficulty in stamping it out in Massachusetts where it was established?

Mr. ORTON. The man who received those potatoes from abroad destroyed the potatoes on which he saw evidence of the disease, and in the crop grown no evidence of the disease appeared. It is too soon, however, to make sure it may not develop in later crops.

The CHAIRMAN. Have you studied the methods of control that are used in other countries?

Mr. ORTON. Yes, sir.

The CHAIRMAN. Do you know how successful they are?

Mr. ORTON. They are not successful, excepting in preventing the spread of the disease to a limited extent. They do that by prescribing severe penalties for the sale of seed infected by this disease.

The CHAIRMAN. You know that in this country, except in a comparatively few localities, potato growing is a side issue, a sort of a garden crop, and the average farmer will plant from one-tenth of an acre to an acre of potatoes?

Mr. ORTON. Yes.

The CHAIRMAN. Suppose such a farmer should introduce the disease into his patch of potatoes. If he discovered it at once and abandoned that plot for the raising of potatoes and moved his patch on to another part of his farm and got clean seed, he would not suffer any further, would he, from the disease, and in the course of time it would die out on that farm?

Mr. ORTON. If he established a strict quarantine against the piece of land that had been infected he would probably be able to stamp it out, but it is possible for the disease to be carried on the tools and on the feet of the animals passing from infected fields to others.

The CHAIRMAN. It does not affect any other grain or vegetables?

Mr. ORTON. Not so far as we know.

Mr. HAWLEY. Can you destroy the fungus by dipping it in some solution, as they destroy smut in oats?

Mr. ORTON. No, sir. The fungus becomes internal; it penetrates the tissue of the potato beyond the reach of any chemical you might use. The only remedy would be absolute destruction of the diseased potato.

Mr. McLAUGHLIN. You were before the committee last June when we were considering the Simmons bill, this nursery stock bill?

Mr. ORTON. Yes, sir.

Mr. McLAUGHLIN. At that time you spoke of this potato disease, and it seemed to me that you then had the idea that that bill was broad enough, and gave the Secretary of Agriculture authority enough to meet the ends you are seeking now.

Mr. ORTON. Yes, sir; that is the case. The Simmons bill will protect us against this disease.

Mr. McLAUGHLIN. The question has been raised now, though, in this way: Will the Simmons bill authorize and permit the Secretary of Agriculture to exclude the importation of potatoes except in case they are to be used for seed? Would the Secretary of Agriculture under the Simmons bill have authority to exclude potatoes brought in from foreign countries for commercial purposes, for sale, and not for seed purposes?

Mr. ORTON. He should have that authority. As to whether the Simmons bill carries that authority I can not say.

Mr. McLAUGHLIN. Have you talked with the legal officers of your department to see how they would construe the Simmons bill?

Mr. ORTON. I do not know that that point has been brought before our solicitor.

Dr. L. O. HOWARD. The Simmons bill would enable the Secretary to exclude them.

Mr. McLAUGHLIN. For all purposes?

Dr. HOWARD. Yes, sir.

Mr. HAWLEY. Suppose a shipload of potatoes were received at the port of New York in the ordinary course of commercial importation, would the Secretary of Agriculture, under this bill, have authority to exclude those potatoes from entry into the United States?

Dr. HOWARD. Under section 8 of the bill the Secretary of Agriculture has authority to quarantine against any country in which such diseases occur.

Mr. HAWLEY. But the potatoes have already arrived in the port of New York.

Mr. GRUBB. I think the new bill that we are having prepared covers that.

Mr. HAWLEY. There might be an outbreak of the disease in some country that the Secretary did not know about, and possibly no one knew that the potatoes were diseased. It might be just beginning to get a foothold there and a shipload arrives at the port of New York ready for entry.

Mr. McLAUGHLIN. I think, Mr. Hawley, there is a section of the Simmons bill that directs the Secretary of Agriculture to inspect such an importation after it reaches here, and if he finds it infected he is directed to destroy it if he is not able to eradicate it or correct it by fumigation or such other means as are used in nursery stock cases.

Mr. HAWLEY. If it is in the bill that is all that is necessary, but I am a little in doubt as to whether the authority goes to that extent.

Mr. GRUBB. May I have a word that may solve this?

The CHAIRMAN. Certainly.

Mr. GRUBB. No country is permitted to load cattle for the United States or any live stock. All countries are quarantined against live stock until they submit evidence through qualified veterinarians of our own that are sent over there. So there is never any danger of any shipment coming to this country infected. It is always inspected and quarantined against importation until satisfactory evidence to the department has been furnished that there are no contagious or infectious diseases, and I would suggest that this bill be made on the same lines.

Mr. McLAUGHLIN. But that would not meet the situation as to nursery stock. There are inspections of nursery stock in foreign countries, but the experience our nurserymen have had, and the officials of the department have had, shows very clearly that that inspection of nursery stock in foreign countries is absolutely worthless. Foreign officials go through the form of inspecting it, but they do not really inspect it, and they permit the importation from those countries of stock very badly infected.

Mr. GRUBB. But the result is absolutely different in live stock. The Government keeps qualified veterinarians under the pay of the United States who protect the live-stock interests of the American grower, and even when outbreaks occur, animals in transit are never allowed to land; there is no inspection necessary, but they are just absolutely barred and prohibited. While I am on my feet, if the chairman will permit me to add one thing; he spoke of the potato as a garden crop. The potato furnishes 20 per cent of the food consumed by the average American family, and there are whole districts and counties—Aroostook County, Me., grows 20,000,000 bushels; it

is its sole product, its sole revenue. There is no dairying, no live stock, no growing of grain; its sole revenue is from eighteen to twenty million bushels of potatoes solely, and if they would get this disease, with the peculiar soil characteristics there, it would impoverish every farmer in that county; it would be true of Greeley, Colo., and Grand Valley on the Western Slope, and many districts in California and Oregon, as well, Mr. Chairman, as the Kaw Valley of Kansas.

The CHAIRMAN. I had in mind, of course, certain sections of the country where potato growing is the principal industry of the farm; but I think I was speaking by the card in saying that, considered numerically, the great majority of farmers throughout the country grow potatoes just as they grow garden crops.

Mr. HAWLEY. My idea in the suggestion I made was this: Nearly all, if not all, the diseases that farmers in this country are plagued with have been sent to us from foreign countries, and if the putting in of some specific words can keep out some new disease, it seems to me the addition of the words would be very advisable, if it is absolutely sure that in a commercial importation of potatoes or any other crop likely to be infested, the Secretary of Agriculture has the power to deal with them, whether they are brought in for one purpose or another, for all purposes whatsoever. It does not seem to me that that section makes it absolutely sure. We have all the diseases in this country we need now. I think the Doctor will testify to that.

The CHAIRMAN. It will be very easy to amend this bill along the lines suggested by Mr. Hawley, and that is a matter the committee can take up if it decides to give further consideration to this particular measure. I think we have in our record now all the information we require on this particular point, and are very much obliged to Mr. Orton.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 14, 1910.

AFTERNOON SESSION (CONTINUED.)

STATEMENT OF DR. L. O. HOWARD, CHIEF BUREAU OF
ENTOMOLOGY, DEPARTMENT OF AGRICULTURE.

The CHAIRMAN. We have reached the Bureau of Entomology in the course of our regular hearings on the appropriation bill, and I have asked Dr. Howard, the chief of that bureau, if he will, to present first a written statement covering the general work of his bureau.

Dr. HOWARD. Mr. Chairman and gentlemen of the committee, I have brought with me, because I thought you would be interested, a map showing the present distribution of the gypsy moth and the brown-tail moth in New England, with the different colors indicating the spread by years. I have also brought a drawing illustrating the different stages of the gypsy moth here, another one showing the different stages of the brown-tail moth here [indicating drawings].

Mr. HAWLEY. How many times magnified?

Dr. HOWARD. Very much, sir. The spread of the gypsy moth is a little over an inch, and of the brown-tail a little under. The gypsy moth passes the winter in the egg stage. That is the stage in which the gypsy moth is likely to be brought in in nursery stock, a mass of eggs the size of a half dollar attached to the trunk of the nursery stock. The brown-tail moth hibernates in a silken nest, and each one of these nests contains 250 small caterpillars. It is in that stage that this insect is being brought into the United States on nursery stock.

I have another drawing illustrating one of the most valuable of these insects' enemies, which we have brought in in our importation of parasites—this large green beetle, allied to a species we have in this country, but which has the advantage of climbing trees. Our species confines itself to work on the ground. This climbs the trees and kills the caterpillars.

Mr. HAWLEY. What does it do, eat the caterpillars, or suck the juice?

Dr. HOWARD. Eats them; sucks the juice first and then eats the remains.

Mr. HAWLEY. Is that the natural food of that beetle?

Dr. HOWARD. The natural food. It feeds upon nothing else except caterpillars.

The CHAIRMAN. How many caterpillars can a beetle eat? A caterpillar is so much larger than the beetle that one caterpillar would furnish rations for several days, would it not?

Dr. HOWARD. It looks like it, but they are very voracious, and they assimilate their food very readily, and one beetle will kill 25 to 30 caterpillars a day.

Mr. HAWLEY. Is he in any way a pest himself?

Dr. HOWARD. Not in any way at all. He is purely carnivorous, feeding exclusively on other insects.

Mr. HAWLEY. Can we import him in large quantities?

Dr. HOWARD. We have done that to a considerable extent. I offer these as exhibits to the remarks which I shall read. Here is a map showing the present distribution of the cotton boll weevil, indicating the spread by years. The single line of counties, which is marked, is called the quarantine area, and constitutes the district against which Georgia and Alabama are quarantining.

The CHAIRMAN. Does this particular beetle attack any other kind of caterpillar?

Dr. HOWARD. Any caterpillar.

Mr. HAWLEY. You say the gypsy and brown-tail moths are down in Georgia?

Dr. HOWARD. No, sir; I am talking about the boll weevil now.

Mr. LAMB. The area affected by that boll weevil is steadily increasing, is it not?

Dr. HOWARD. Yes, sir. When the map comes to you you will see they have made quite a considerable spread this year. That map was prepared on the 15th of October, showing the latest information we have on the spread of the weevil. [Reading:]

Copies of the annual report of the Bureau of Entomology are on the table. The present is a very summary account of the principal features of the work for the year elapsing since the last hearing.

The work in the effort to prevent the further spread of the gypsy moth and the brown-tail moth has been carried on in a manner similar to that done in previous years. About 500 men have been employed, scouting in the winter time to determine the spread and at the same time destroying egg-masses when found. In the summer time they have been employed cleaning out the underbrush along the principal roads, spraying the trees in the cleared strips during the period when the caterpillars are young, and banding the principal trees with tanglefoot to prevent caterpillars from crawling up. As a result of this work the spread of the insect has been very slight, and the living conditions in the towns and along main roads are at the present day better than they have been at any time since 1900. The woodlands, however, have been seriously attacked in places, and a method of distribution unsuspected before but ascertained this summer accounts for this woodland spread. It is by the carriage of the very young caterpillars by the wind. They are provided with very delicate and light bulbous hairs which are really aerostatic and enable the wind to carry them considerable distances. The map exhibited indicates the present distribution of the gypsy moth. The brown-tail moth has spread largely to the northeast, but as this insect can be handled by property owners, except in large forests, the main work had been directed against the gypsy moth. The work has all been done in cooperation with State authorities, and the State work has been very effective in Massachusetts, Maine, Connecticut, and Rhode Island. It has not been effective in New Hampshire, and the very considerable spread to the north in this State has been due largely to the apathy of the State authorities and to the totally inadequate sum appropriated by the State for this work. The Rhode Island colony and the colony at Stonington, Conn., have been practically exterminated. A new colony, however, has been found at Wallingford, Conn., much to the west, but the State is concentrating upon this outbreak with energy, and there will probably be no spread from this point.

An important part of the work during the past year, and indeed during the preceding year, has been in the way of trying to prevent the spread of the gypsy moth by large jumps—that is to say, by being carried in the egg stage on nursery stock and forest products by the railroads to other part of the country. A system of nursery inspection has been begun, and with the cooperation of the railroads on notification from them, lumber, cordwood, railroad ties, telephone poles and material of that sort liable to carry the eggs are inspected before transportation out of the infested district.

Mr. McLAUGHLIN. In that kind of work which your bureau is doing, suppose the owner of the timber or lumber, or the railroad company

transporting, does not wish you to inspect it, or to have anything to do with it; have you authority to take it anyway?

Dr. HOWARD. No, sir.

Mr. McLAUGHLIN. You are entirely at their mercy?

Dr. HOWARD. We are entirely at their mercy. We point to the law of March 3, 1905, which prohibits any common carrier from knowingly transporting plants infected by injurious insects, with a severe penalty, a fine or imprisonment, and we make it a point to them that if they carry the stuff out of this district they can not be said to be carrying it unknowingly. In other words, we have been putting up a sort of a bluff to them, which has acted with perfect efficacy so far, because if they are not scared they have enough patriotism to notify us, and they have invariably notified us.

Mr. McLAUGHLIN. It is not a bluff, is it? Although you may not have a right to seize this stuff and inspect it—there may be no law particularly authorizing you to do that—still, if the railroad company is plainly subject to a penalty for transporting it—

Dr. HOWARD. Knowingly.

Mr. McLAUGHLIN. Knowingly—you call the attention of the company to it, and the purpose and result would be the same, would it not?

Dr. HOWARD. It is the opinion of the Solicitor, to whom I have presented that question, that we could not successfully prosecute them under the law on account of the word "knowingly." They could say, "We knew it came from that district, but did not know it carried the eggs of the gypsy moth."

The CHAIRMAN. As a matter of fact, they have made no objection, have they?

Dr. HOWARD. No; not so far. [Continues reading:]

All egg masses found are destroyed before the material is moved. At the present time, Christmas trees, of which large numbers are shipped from the infested region to other parts of the United States, are being inspected before the railroads will consent to move them. There should be a national law permitting a quarantine against that whole region.

The work with the parasites of the gypsy moth and the brown-tail moth has been carried on vigorously. Larger quantities of the raw material from which the parasites are reared have been received than during any other year. This material has come from Russia, Italy, Germany, France, and Japan, and during the present summer the official experts of the Spanish and Portuguese Governments have been induced to assist in the work without compensation, and material has been received from these countries. Careful examination of the territory infested in New England indicates that several of these parasites and predatory enemies have become thoroughly established and are spreading widely. One of them (*Monodontomerus*), which was first recovered in the field in the early winter of 1908 and was found to have been distributed over 500 square miles in the early winter of 1909, and which is reported in my annual report for 1910 to have been found well over the border line in New Hampshire its original liberation having taken place near Boston), has since the last report was written in September, last, been found to have spread well up into New Hampshire and out into Maine as far as Portland. The European predatory beetle (*Calosoma*), of which 100 specimens were liberated in 1906, is now so abundant in some localities as to affect the gypsy moth materially. At a reasonable estimate of the rate of increase of this insect, there should be 10,000,000 of them in New England next year and 100,000,000 the year afterwards. These two insects, therefore, are in a very encouraging condition. An interesting point is that two of the introduced parasites which are increasing are turning their attention to certain native species, such as the fall webworm and the tussock moth, as well as to the caterpillars of the white cabbage butterfly. This means not only an additional help in the warfare against certain other injurious insects, but it helps to assure the perpetuation of these parasites on American soil. Several other species seem to be thoroughly established and promise to spread rapidly. We have not been able to establish a number of others of the imported

species as yet, and it may be that some of them will not live in the New England climate. We hope to make strong efforts to bring in and establish very many of these species with which we have as yet not been successful.

During the year the cotton-boll weevil has continued its spread, largely to the east, as indicated on the map, working out into central Mississippi and entering into south-western Alabama. Inasmuch as strong objections are made in certain quarters to the fall destruction of the plants, considerable work was done to ascertain whether approximately the same results which came from that practice can be obtained by some other means. Special attention has been paid to the possibility of utilizing parasites, but, owing to the unprecedented dryness in Texas, it was impossible to accomplish as much as was hoped for. Nevertheless some good results have been reached. Further studies have been made of the life history of the insect in the new territory invaded, especially as to its methods of hibernation, which are different from those in Texas. Experimental work in many directions has been carried on.

Mr. LEVER. What is your method of cooperation between the Bureau of Plant Industry and your bureau with reference to the boll weevil?

Dr. HOWARD. We are handling different aspects entirely. We are working on the life history and the experimental work, and they are working with demonstrational work. They are not doing experimental work at all.

The CHAIRMAN. On what ground is objection made to fall destruction?

Dr. HOWARD. On the ground that if the plants are absolutely destroyed so much valuable material for enriching the soil is gone. We are experimenting with plowing the plants under, and things of that kind. [Continuing reading:]

Work against tobacco insects has accomplished a great deal. A new and very cheap insecticide has been discovered which promises to displace those commonly in use. It has been shown that fall plowing is a perfectly feasible and sound remedy for the hornworm. It has also been shown that the destruction of two species of weeds growing about the tobacco fields will greatly reduce the numbers of the so-called wireworm of tobacco.

Investigations of sugar cane and rice insects have been begun, with headquarters at Audubon Park, La., the initial work being directed against the sugar cane stalk-borer, the root-beetle, the sugar cane mealy-bug, and the root-weevil or maggot of rice.

Work on the Argentine ant, a species which has threatened to destroy the orange industry in the parishes of lower Louisiana, has been continued. The results of the trap and flooding experiments have been encouraging, and it is believed that a practical remedy can be perfected.

Decided advance has been made in the study of the cotton red spider. It appears that it starts every spring from certain cultivated plants on which it can be destroyed by means of a special spraying mixture perfected as the result of this work.

Mr. LEVER. I want you to go into a little more detail on that red spider proposition. I think it is more destructive than the boll weevil.

Dr. HOWARD. I should be glad to have Mr. Hunter, who has had immediate charge of that work, answer that.

STATEMENT OF MR. W. D. HUNTER, BUREAU OF ENTOMOLOGY, DEPARTMENT OF AGRICULTURE.

Mr. LEVER. I would just like to have you go into a little more detail about the destruction of the red spider, its habits, etc.

Mr. HUNTER. We sent an agent to South Carolina in March last season, and continued him there until some time in August, when he was offered more money by one of the experiment stations than we could pay him, so he left the service. During the time that man was there he made very substantial progress. One thing that devel ped,

somewhat to our surprise, was that the red spider is considerably more of a pest than we had supposed, from the accounts we had received from South Carolina.

We found it was true that the spider, starting in one edge of a field, sweeps almost like fire over the whole area. That is the common expression that is used in describing it. Whenever the climatic and moisture conditions are right, it will multiply and spread with amazing rapidity. This Mr. Wilson, stationed at Batesburg, S. C., began an investigation in the early spring of the conditions under which the red spider passed the winter. He found from the examination of immense quantities of trash in cotton fields, corn fields, and other situations, that no red spiders were to be found. He did find them, though, in considerable numbers on English violets, which, in that part of the country, are grown almost invariably around the houses. He continued his observations through the season and found in a number of cases that the infestation of the cotton fields could be traced back to the dooryards in the immediate vicinity of the house, where these English violets were growing. Then the point was to carry on experiments with some chemical means for destroying the outbreak in its very incipency on the violet plants. Mr. Wilson experimented with the various modifications of the lime and sulphur wash, and finally hit upon a modification of it which is effective in destroying the spider on any sort of vegetation without injury to the plants whatever. In one place, almost in the city of Batesburg, S. C., that I inspected in August, I found that Mr. Wilson had succeeded in stopping an outbreak after it had gone about halfway across a field.

Mr. HAWLEY. Do you remember the formula for that spray?

Mr. HUNTER. No; I do not recall it.

Mr. LEVER. Could you put that in the record when you come to revise?

Mr. HUNTER. Certainly. (Sulphur, 3 pounds; lime, 3 pounds; water, 3 gallons.) The spider started in this case, as I have described, from violets on an adjoining property, when about half-way across the field, entering in a circular fashion. All the plants in that farm were killed as if they had been sprayed with hot water, or something of that kind. Mr. Wilson worked around the outer edge of that circle and stopped the infestation right there. At the same time, in numerous other places in and about Batesburg, the infestation continued indefinitely and reached the remotest parts of large cotton fields. The work of the season seems to indicate a rational and economic method of controlling that pest.

Mr. LEVER. Is it really an economic method of meeting the ravages of this insect?

Mr. HUNTER. It is certainly economical if it can be applied at the proper time, early enough.

Mr. LEVER. Will the ordinary farmer be able to use it to advantage? Will he be able to make his mixture and apply it?

Mr. HUNTER. Our line of procedure for next season is to place a man down there, supply him with materials, and have him conduct a number of demonstrations showing the farmers how this pest can be stopped in the very beginning. I think, if it is brought to the attention of those planters, how easy it is to control the pest in the beginning, that it will develop into an economical, practical remedy.

Mr. LEVER. Do you happen to know how big the area is in which the insects appear? Does it cover practically the entire State and other States of the South?

Mr. HUNTER. It extends far out of South Carolina. There have been severe outbreaks as far as west Louisiana, and it exists in Texas, but the dry climate does not bring about the conditions that are favorable for this insect.

Mr. LEVER. Is it as destructive as the boll weevil, as a matter of fact?

Mr. HUNTER. It is quite different. The boll weevil destroys the fruit; there is a magnificent plant left. But the red spider destroys the whole plant. They look as if they might have been struck by lightning.

Mr. HAWLEY. How large are the plants when the spider attacks them?

Mr. HUNTER. Very small; 5 or 6 inches high.

Mr. HAWLEY. Will it continue to destroy them throughout the whole growth of the plant?

Mr. HUNTER. Yes, sir.

Mr. HAWLEY. It is not confined to any particular stage of the growth?

Mr. HUNTER. I saw cotton plants as high as that in August [indicating about 4 feet] in Batesburg that had been killed.

Mr. LEVER. Is there anything to the theory that the poke stalk is a good place for them to breed from?

Mr. HUNTER. Not as far as we know.

Mr. LEVER. That seems to be the general impression there among the farmers, that the poke stalk growing along the ditch and banks would be a good breeding place for these little fellows and they spread from them.

Mr. HUNTER. There are a number of popular theories. Another one is that they come from the elm trees. But, as far as we have discovered up to this time, everything can be traced back to the violet. In fact, we have a decided suspicion that the red spider itself may have been brought into this country on the English violets, and that it is another example of the danger of importing injurious insects.

Mr. LEVER. Have you money enough estimated for here to do this work thoroughly and with expedition and fight it vigorously?

Mr. HUNTER. I think we can. It resolves itself now into two problems—one of checking up the results of last year and finding out if Mr. Wilson's theory about the restriction of the spider to violets is sound, is to be verified; and, at the same time, whoever is down there will conduct such demonstrations as I have outlined.

Mr. LEVER. You do not need any more money, then?

Mr. HUNTER. No; I think we could do very well with the present amount.

Mr. HAUGEN. Do you think it is an entirely new pest?

Mr. HUNTER. Apparently it is of rather recent origin. As I intimated, it is probably of foreign importation. It is attracting more and more attention, I believe.

Mr. LEVER. Oh, yes; it has spread very greatly in the last three years in South Carolina. It is practically in every county in the State.

Mr. HAUGEN. To what extent has it extended its ravages? Is it quite general?

Mr. HUNTER. It extends practically all over Georgia, into southern Alabama, in Florida, in the cotton regions, and up into North Carolina. In fact, it occurs commonly and destructively in all the Atlantic cotton-producing States.

Mr. LEVER. The climatic condition has something to do with it; the wetter the season, I understand, the more he spreads?

Mr. HUNTER. Undoubtedly.

Mr. HAWLEY. What would it cost to spray an acre of the cotton plants and kill the spider?

Mr. HUNTER. If it should be undertaken to spray a cotton field after the spider has spread through it, it would probably cost \$10 an acre. That might be prohibitive. But the point is to start at the beginning, when there are only a few rows of cotton around the edge infected.

Mr. HAWLEY. Suppose they went around the edge of the cotton field and sprayed all the plants and the adjacent weeds, would the spray remain on the plants and kill the spiders when they appear?

Mr. HUNTER. No, sir; it kills by coming in contact with the insect.

Mr. COCKS. How do you figure it would cost \$10 an acre? Is it so much more expensive than spraying potatoes or cucumbers?

Mr. HUNTER. Somewhat for that reason, and also for the reason that the ingredients in the spray are more expensive than those commonly used in spraying potatoes, much more expensive than Paris green.

Mr. COCKS. I was thinking of the Bordeaux mixture that we have to spray cucumbers with.

Mr. HUNTER. Really, the important expense is in the amount of labor required. These spiders live beneath a light web. They live on the under surface of leaves. The ordinary process of spraying does not have any effect upon them. The under surface has to be reached and more force has to be used in applying it than is required in the case of other insects.

Mr. HAUGEN. To what extent has the cotton crop been destroyed in either of these States by this insect?

Mr. HUNTER. I have not made a careful estimate of that. Probably Mr. Lever can tell you as to conditions in the neighborhood of Batesburg.

Mr. LEVER. I can speak as to Lexington, and I know of one field of 10 acres which was absolutely destroyed within 2 miles of Lexington. It did not spread any farther, because that was the size of the field. It was absolutely destroyed, as if it had been destroyed by hot water. Mr. Wilson came down there and saw that.

Mr. HANNA. Does this red spider eat anything except the cotton plant?

Mr. HUNTER. Violet and a few other plants it overflows upon when it becomes very numerous.

Mr. HAWLEY. Where does it spend the winter?

Mr. HUNTER. On the ground, in cracks, crevices, and trash.

Mr. HAWLEY. Does it hibernate, as it were?

Mr. HUNTER. Yes; probably in as true a sense as any insects hibernate.

The CHAIRMAN. Now, Dr Howard, will you resume your statement ?
Dr. HOWARD (reading):

The work in the investigation of insects damaging forests has reached a point where the destructive bark beetles of the West can be readily controlled. Control work carried on in six cases in Colorado and Idaho shows that a disposal of a total of 4,000 trees during a period of four years, at a cost of \$2,000, or an average of 50 cents per tree, has ended the depredations of the Black Hills beetle, which during the preceding period of 10 years had caused an average death rate of more than 7,000 trees per year. Work carried on in cooperation with private timber owners and forest officials in northwestern Montana, inaugurated last autumn, has led to the proper treatment by cutting and barking or otherwise disposing of between 9,000 and 10,000 beetle-infested trees by 10 or more of the owners. This will probably control the depredations of the insect over an area of more than 100 square miles in which the timber has been dying at an alarming rate. This year there has been organized a cooperative project for the control of bark-beetle depredations in northeastern Oregon and western Idaho, involving an area of over 13,000 square miles. The cooperation is between the Bureau of Entomology, the Forest Service, and private owners. It is believed that with hearty cooperation enough trees involved in the new infestation can be located, marked, and disposed of before the 1st of July, 1911, to effectually check the depredations which have been going on for the past five or six years and which have been destroying nearly a million trees a year.

Mr. HAWLEY. When do the beetles leave one tree and go to another ?
Dr. HOWARD. I will ask Dr. Hopkins to answer that.

**STATEMENT OF DR. A. D. HOPKINS, BUREAU OF ENTOMOLOGY,
DEPARTMENT OF AGRICULTURE.**

Dr. HOPKINS. These beetles pass the winter in the bark of the trees and emerge the next spring or the next summer. They leave the trees about the 1st of July or the middle of July and make their fresh attack on the living trees.

Mr. HAWLEY. They eat the soft wood under the bark ?

Dr. HOPKINS. They eat the soft bark; they do not eat the wood. They simply extend their burrows through the soft living bark, and in that way girdle the trees.

Mr. HAWLEY. How do you destroy them ?

Dr. HOPKINS. Simply cutting the trees and removing the bark at any time from the 1st of September until the 1st of the following July is sufficient to kill the insects.

Mr. HAWLEY. Do they go into the bark under the ground ?

Dr. HOPKINS. No, sir.

Mr. HAWLEY. How far above the ground ?

Dr. HOPKINS. It is usually above the point where the trees are cut.

Mr. HAWLEY. How far up ?

Dr. HOPKINS. Up to the branches, or among the branches; but it is not at all necessary to try to destroy all of them.

Mr. HAWLEY. What variety of trees do they attack ?

Mr. HOPKINS. The western white pine, the yellow pine, the lodge-pole pine, and occasionally the spruce.

Mr. HAWLEY. Douglas fir ?

Mr. HOPKINS. Not this particular species that we are dealing with in northeastern Oregon.

Mr. HAWLEY. Is there any parasite that will check their ravages ?

Mr. HOPKINS. No; there is nothing to be hoped for from parasites or other natural enemies.

Mr. HAWLEY. Suppose a local owner of some forest trees should find the beetle operating on them; would you advise him to strip off

the bark from about the crest of the ground up as far as the ravages show and burn the bark?

Mr. HOPKINS. No; never burn the bark; it is never necessary to burn the bark. The simple removal of the bark exposes the young insects and that kills them. Sometimes it is found more practicable to scorch the bark on the felled trees; it is sometimes easier to scorch it than it is to remove it.

Mr. HAWLEY. You can tell how far the infestation has gone up the tree by following the work of the beetles—the little tunnels they cut?

Mr. HOPKINS. We tell that by the pitch—exudations of resin—on the bark ejected by the beetles from the entrance burrows and by the fading of the leaves.

Mr. HAWLEY. Do they burrow up along the bark for considerable distances without coming to the surface?

Mr. HOPKINS. They do not come to the surface until they become the adult insects, then emerge and fly away. I would like to show you a map of an area in which we are carrying on control work. This shows the area in northeastern Oregon, known as the northeastern Oregon project. Thorough investigations by agents of the bureau, assisted by the Forest Service, show that from 35 to 75 per cent of the merchantable-sized trees, or about 8,000,000 trees, have been killed by the mountain pine beetle in the past five or six years, and that this insect is spreading very rapidly. The first points of infestation, apparently, were at this place, and over here [indicating] a very small spot from which it has spread. It has now killed practically all of the timber in this country here, of this national forest, and is now spreading southward into the more valuable yellow-pine areas and into privately owned land. The little red spot here shows where the private owners have cut infested timber under our instructions. They have spent about \$1,044 to cut the timber there, but you see it is a very small beginning, although we know that will control quite a large area. It is not at all necessary to try to destroy all the beetles or to try to exterminate them, because the mere reduction of their numbers so that they are no longer powerful enough to attack and kill trees will result in their disappearance.

Mr. McLAUGHLIN. You speak of scorching the bark. Could that be done in such a way as to kill the beetle without destroyin the tree?

Mr. HOPKINS. When a tree is infested it is already destroyed; when a tree is once infested with this insect it is a dead tree—that is, it will die next year. We find it very remarkable that the leaves remain green after all the bark is dead. The attack will be made in August, the bark killed, the wood turning blue, but the leaves will remain perfectly green until the next May or June before they fade or die. But the tree is certain to die.

The CHAIRMAN. What do you call the beetle?

Mr. HOPKINS. The principal one responsible for the depredations here is the mountain pine beetle.

The CHAIRMAN. What other States are infested in addition to Oregon?

Mr. HOPKINS. The entire Northwest, including Oregon and California.

The CHAIRMAN. To what extent is it prevalent in Colorado?

Mr. HOPKINS. This particular beetle is not in Colorado.

The CHAIRMAN. There is a beetle there which kills the trees. I observed last summer exactly the condition you have described, the gum issuing from the holes made by the beetle, and then the fading of the leaves, which indicated that the tree was dying.

Dr. HOWARD. That is another species of the same genus. It is the Black Hills beetle.

The CHAIRMAN. Could that be controlled in the same way?

Mr. HOPKINS. In the same way, exactly.

The CHAIRMAN. When do you say the tree should be cut down?

Mr. HOPKINS. Any time from the 1st of September to the middle of the following July in the case of that beetle in Colorado; but the more northern ones come out earlier, so work ought to be completed by the 1st of July.

The CHAIRMAN. If the tree is cut down and the bark is not removed, does the beetle mature and go to other trees?

Mr. HOPKINS. Yes, sir.

The CHAIRMAN. So that the bark must be removed as far up as the infestation is observed?

Mr. HOPKINS. Yes, as far as it is necessary to remove it. If there is a certain amount of time available or money to dispose of the infestation within a given area, it is important to economize. If more beetles can be killed by removing half the bark of two trees than by removing all the bark from one tree, then it is more practicable to simply pick out the principal ones and remove the bark that is thickly infested, leaving the other.

The CHAIRMAN. Are you doing any work in Colorado at all looking to the extermination of the beetles?

Mr. HOPKINS. As Dr. Howard mentioned, we have conducted six demonstrations there, all of them entirely successful. Where the timber was available for utilization as lumber it paid all the expenses and a profit besides. Where it was not available for utilization, it cost on an average of 50 cents a tree to cut it and remove the bark. If we get .75 per cent of the trees infested within the area of a township, more or less, it will influence a very large area in bringing about control, as we have shown.

Mr. HAWLEY. How far will the beetles fly?

Mr. HOPKINS. There is no telling how far they will fly.

Mr. McLAUGHLIN. How large are the townships out there?

Mr. HAWLEY. Six miles square.

Mr. McLAUGHLIN. A town is the survey 6 miles square.

Mr. HOPKINS. This is laid off in ranges and townships (referring to the map).

Mr. McLAUGHLIN. A township is the municipal organization.

Mr. HAWLEY. Does the insect do the damage in the larval stage or after it becomes a mature beetle?

Mr. HOPKINS. The first damage is done by the parent beetles entering the bark and excavating long galleries through the inner living bark. Then the girdling is completed by the young, which hatch from eggs deposited along the sides of these burrows. By the time the larvæ begin to work the bark is dying, so that the adult insects are responsible for the primary injury and the larvæ for the ultimate death of the trees.

Mr. HAWLEY. What is the color of the larvæ?

Mr. HOPKINS. It is a small, white grub.

Mr. HAWLEY. Have you any publications on the subject?

Mr. HOPKINS. Yes; we have a very exhaustive monograph on that group of beetles which we think represents the most important work we have done so far.

Mr. HAWLEY. What is the number of it?

Mr. HOPKINS. Bulletin 83, part 1, here, is an extract of the bulletin describing the Black Hills beetle and the one we have been discussing. We have just issued a number of circulars which give information in the most condensed form of not only these insects, but other insects with which we have to deal.

Mr. HAWLEY. Are any of these bulletins available for distribution like the farmers' bulletins are?

Mr. HOPKINS. Yes. These circulars are available for free distribution and we use them in our correspondence. They were gotten up with that idea. They are written in the most popular form, leaving out technical names and giving condensed information.

Mr. HAWLEY. Do these bulletins also contain the recommendations you make for destruction?

Mr. HOPKINS. Yes; they contain special recommendations for control. And, I will say, we have so completely demonstrated the method for controlling the insect that it has passed the experimental stage. We know what will follow if the owners carry the essential details of our recommendation out. Another thing we know—this particular insect is largely responsible for the destructive forest fires in Idaho and Montana last summer.

We know there was a vast amount of dead timber throughout that forest which was killed by this beetle, because we have been studying it for many years. That dead timber, standing and fallen, contributed greatly to the destruction by fire; to the cause of fire, because the dead trees being struck by lightning often started the fires, the dead timber on the ground contributed to its spread to the living timber; and it also contributed to the difficulty and almost impossibility of fighting the fires. So that in the future, if we are to control forest fires, we must control forest insects and especially these particular species which are killing the forests at a rate almost equal to that caused by fire.

Mr. McLAUGHLIN. Is there any insect of this kind attacking the forests in Michigan?

Mr. HOPKINS. Not to anything like this extent. There is an insect killing the larch or tamarack of Michigan.

Mr. McLAUGHLIN. Have you a bulletin on that?

Mr. HOPKINS. No, we have not a bulletin on that at present. There is a Yearbook article that discusses in a general way this insect; but it is an insect which can not be controlled by any practical means; therefore we have not given it any special attention. We have been confining our attention to problems which offer practical methods of control.

Mr. McLAUGHLIN. The Yearbook article that speaks of this does not suggest a remedy?

Mr. HOPKINS. No; because we have no remedy. There are possibilities in that case of utilizing some of these parasites that Dr. Howard is introducing from Europe, because there they have parasites that control this same insect, which found its ways into this

country and has spread over northern United States and throughout Canada, destroying a very large per cent of the larch. It is very evidently an introduced insect, although we have no records of it.

Mr. HAWLEY. Are there any parasites which attack these beetles?

Mr. HOPKINS. None that we can rely on at present. The birds render very little service, except where we cut out a large part of the infested trees and leave here and there a few infested trees for them to work on. The birds will go to those trees and help to destroy the insects, together with what few natural enemies will concentrate in the trees. Therefore birds offer little encouragement in the control of the insects, because we know it is first necessary to try to control the beetles artificially, that if we merely reduce their numbers they will disappear from natural causes.

Our great need now, Mr. Chairman, is to demonstrate to the practical owner and to the forest official how to do the work properly. In our recommendations we explain how it can be done, but we find that it is very difficult to get them to understand the essential features in those recommendations and apply them properly.

It is a perfectly simple thing to do, but they do not do it without being shown, and many of them will not try until they are shown. But we feel that if we can make a few striking demonstrations in different sections of the Rocky Mountain region and the Pacific slope the men who get the practical training in this work will assist others to profit by it. But unless we do this, we feel that it will be a long time before the information that is now available will be utilized to the best advantage.

Mr. HAWLEY. If these beetles fly long distances and they should get into some of the remoter sections of the forests of the Northwest, large areas, where probably man never goes, they could accomplish an enormous destruction.

Mr. HOPKINS. They have accomplished great destruction already in all of the forests, but through natural causes they die out in certain sections, and it is after many years—a hundred years or more—before they reappear in the same section, thus giving an opportunity for new forests to grow. We know that extensive forests in this country have been destroyed and that generations after generations of trees must have grown up and died and disappeared and other trees have come on, because in the Eastern forests we now have trees only three or four hundred years old. Doubtless trees in these forests would be twice that old if something had not happened to them, and the insects are largely to blame for it. We know that the more destructive kinds of insects attack principally the older, maturer trees; the best timber is always killed first. From that they go on to the smaller trees, and when they are very abundant they attack the reproduction. But their first attack is always on the mature timber.

Dr. HOWARD. Mr. Chairman, it is largely on account of the excellent results of the demonstration work which has been accomplished under Dr. Hopkins's direction in the Northwest and in Colorado that the Secretary of Agriculture has been induced to make the only request for an added appropriation for this bureau, to be devoted to this particular branch of the work—the only large item [reading]:

It was stated last year that the pear-thrips problem in California had been solved. Since that time the bureau has been engaged in demonstrating on a large scale the efficacy of the measures discovered. In this way a large amount of remedial work

was done and the active interest of many orchardists in Santa Clara, Contra Costa, Solano, Sacramento, and other counties has been engaged. The definite benefits gained, as expressed in dollars and cents, have not yet been figured out, but one grower in Santa Clara County showed me in September an enormous crop of prunes, harvested and then drying, and told me that would have had hardly a prune had it not been for the bureau's work.

Demonstration spraying against the codling moth, in cooperation with the Bureau of Plant Industry, has been carried on in pear orchards in California, in apple orchards in Michigan, Virginia, and Kansas with uniformly good results. Careful work with the one-spray method proved this method not to be of special importance under eastern conditions, but it has shown that more thorough spraying and under a higher pressure than has been used before is of advantage at the time of the falling of the petals.

Work against the jointworm has brought out a curious problem which involves sanitary as well as agricultural matters. A mite which attacks the jointworm remains in the straw during the early summer following the harvest, and, when this straw goes into the manufacture of mattresses or enters into the domestic economy of the farm, the mite causes a very annoying skin trouble. The farmer throughout the Middle West and the East draws the unthreshed grain in from the fields, places it in barns, and allows it to remain unthreshed for weeks or months. This facilitates the increase of the mite and causes an increased number of cases of dermatitis. In Tennessee farmers allow the grain to remain in shock long after it should have been thrashed. This also results in an increase of the mite, so that when the grain is thrashed the men and the teams engaged in the work are attacked and caused great pain and suffering. In all cases if the wheat is thrashed directly from the field and as soon after harvest as it is in condition, much of the difficulty will be overcome.

In the Hessian fly investigations, which have been continued, the most striking result has been the decision that what was supposed to be winter-killed wheat in Oregon and Washington has really been the work of the Hessian fly; and the parasites of the Hessian fly, which were introduced from Kansas into Washington and liberated in the vicinity of Vancouver in that State, were shown in the spring of the present year to have taken hold and to have bred for a generation. In that region the fly breeds in quack grass in large numbers, and therefore is not likely to be controlled by the usual variations in time of planting of wheat. This renders the introduction of the parasites and their establishment of the greatest importance—much more so than in other regions where the fly confines its attacks more exclusively to wheat.

The New Mexico range caterpillar, mentioned last year, has been found to have spread from a limited area in northeastern New Mexico into the Panhandle region of Texas and the Cherokee Strip of Oklahoma as well as into adjacent portions of Kansas and Colorado. The gramma grass is being destroyed on the ranges, and no remedy has as yet been discovered. Efforts are being made to find parasites.

The alfalfa weevil, starting in the region about Salt Lake City and spreading rapidly towards the alfalfa fields of Colorado, Wyoming, and Idaho, constitutes a great menace to alfalfa culture. It is a very serious problem, since large sections of irrigated regions in that part of the country are practically dependent upon alfalfa. Some work has been begun on this problem which should be energetically followed up.

The work on insects affecting vegetable crops has been pursued in tidewater Virginia and in North Carolina, Colorado, Mississippi, California, and southern Texas. Many important facts have been ascertained and satisfactory remedies for a number of the pests have been found.

The work on the white fly in Florida has been continued. Fumigation of the affected trees with hydrocyanic-acid gas while killing the white fly was found to be useful only in isolated groves, since where groves are closely surrounded by untreated groves reinfestation rapidly occurs. Therefore the work this year has been concentrated on sprays, which are much less expensive than the gas process. Under authority of Congress an expert agent started in July to visit other portions of the world in the effort to find the original home of the white fly and its natural enemies which may possibly be effective in the United States. Within the past week a letter has been received from him announcing that he has found the fly at Saharampur in northern India, a place in the valley of the Ganges not far from Delhi. He found there two species of ladybird beetles feeding upon the young of the white fly. He also found a parasitic fungus which was killing the fly. He sent a box of the beetles by mail, which arrived a few days since, but the insects were all apparently dead. Another box, coming by express and containing some 200 specimens, was placed upon a steamer at Calcutta sailing November 6 direct for New York and was put in the cold room of the steamer. This vessel is due in New York December 21, and owing to the method

of shipment it is quite possible that a certain percentage of the insects will be alive on receipt, in which case they will at once be colonized in Florida.

The orange thrips, a serious insect enemy of the orange in the southern San Joaquin Valley in California, has been under investigation for about two years. A spray has been found which has been successful. A large number of power sprayers have been purchased by the growers, and extensive operations have been begun under the advice and immediate supervision of agents of the bureau.

The investigation of hydrocyanic-acid gas fumigation in California against the red scale and the purple scale in the orange and lemon groves was begun June 30, 1908, and was completed June 30 of the present year. The investigation was a perfect success. The expense of the operation has been very considerably reduced, and, as a result of the great efficiency of the present system, much longer intervals between fumigations will now serve to keep the groves in good condition. In September I visited the Leffingwell lemon ranch in Los Angeles County, and the manager assured me that in his opinion the investigation has saved the growers of that immediate region at least \$250,000. Many months after the last fumigation the trees showed no signs whatever of reinfestation by scale. In the course of this work the important point was learned that with the use of a high grade of sodium cyanide the results were as satisfactory as with a high grade of potassium cyanide. The value of this discovery lies in the fact that the sodium compounds required in the manufacture of sodium cyanide are widely distributed throughout the world, while commercial deposits of potassium compounds required in the manufacture of potassium cyanide are largely confined to the German Empire. It may therefore reasonably be expected that in the future the sodium may be found supplanting the potassium in American usage.

Under the project, "Work on Insects Injurious to Man and Animals," a large bulletin on remedial and preventive work against mosquitoes, has been published, and work on the house fly (renamed "typhoid fly") has been continued. The work on the cattle tick has been carried on; additional life history studies have been made, and pasture rotation has been demonstrated to be perfectly feasible in southern Texas away south of the Texas fever line. Careful studies have been made of the ticks which carry the spotted fever of human beings. A camp laboratory was established in cooperation with the Montana State Experiment Station and the Bureau of Biological Survey in the Bitter Root Valley in Montana, where a very virulent phase of this disease exists. This valley has an area of some five thousand square miles, with an approximate population of 60,000, including the city of Missoula. The disease is for the most part a country disease, and so virulent is it in this valley that the deaths of those attacked virtually reaches 100 per cent. It has been found that the early stages of the tick are attached only to certain small, wild rodents, and that the adults occur only on cattle and horses. The disease, although the causative organism is not known, is undoubtedly conveyed from the small rodents to human beings, either directly or after attachment to cattle and horses. It is obvious that, if the adults can be killed off before reproduction, the ticks will be practically wiped out. Therefore one way of heading off this disease is to dip or oil all cattle and horses in the valley during the months of March to July for a single year. This it is estimated can be done at an expense of \$10,000 to \$12,000. Other possible measures are in view which may prove to be more economical.

In the work on insects injurious to stored products further investigations have been made, as to the point of infestation to export flour, and it seems to be established that in the vast majority of cases the point of primary infestation is in the milling establishments themselves. Rice mills in southern Texas and Louisiana have been investigated; the export docks in Philadelphia, Baltimore, and New York have been visited; fumigation has been carried on in mills, grain storehouses, and bakeries, and seaboard mills and terminal elevators have been inspected. In cooperation with the Bureau of Chemistry insects injurious to imported dried fruits, especially Smyrna figs, have been studied, and at the request of fig importers an agent was sent to Smyrna and there studied the methods by which the exported figs become wormy. He got to the bottom of the matter, and the bureau will be able to give advice which will, if followed, practically put a stop to wormy figs.

The work in bee culture during the year has been especially important. Bee diseases, the existence of which was not generally known, have been discovered in all but two of the United States. This knowledge being brought to the attention of the bee keepers is resulting in a general agitation for State legislation looking to the control of these serious diseases. We now have State laws in 25 States and 14 are now agitating.

Last December I described to the committee the importation of winter nests of the brown-tail moth upon nursery stock coming from France, Holland, and Belgium, and

the efforts made by the bureau to secure the inspection of this stock at points of ultimate destination with the assistance of notifications from the customhouses and the railroads. The same conditions held during last winter and spring. Shipments of nursery stock to the number of 291 were found to be infested with nests of the brown-tail moth, and these went to the States of Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Louisiana, Michigan, Montana, New Jersey, New York, Ohio, and Virginia. In most of these States the inspection was done by State officials. Notification from the bureau in such cases was all that was necessary. In other cases, where there was no State service, inspection was carried on either by employees of the bureau or by expert collaborators appointed for the purpose, the expenses being paid from the fund for the prevention of the spread of moths. In June, 1910, while on a trip to Europe to arrange for further shipments of the parasites of the gipsy moth and the brown-tail moth, the speaker visited Holland, France, Belgium, and England to look once more into the conditions of growing nursery stock for exportation, and into the inspection systems in those countries. The insect conditions in the regions of the large exporting nurseries of France in the vicinity of Angers, Orleans, and Ussy were found to be very favorable. For some reason it was with the utmost difficulty that any kind of a caterpillar could be found in the north of France, and not a single brown-tail caterpillar or gipsy-moth caterpillar could be found in any of these nursery regions. The mayor of Angers, during 1909-10, put in force the hitherto neglected police measures providing for the destruction of every visible nest of the brown-tail moth during the winter season.

The efficiency with which this work was carried out undoubtedly contributed toward the clean condition of the Angers nurseries the present season. It seems impossible that the condition of nursery seedlings imported from France this winter should be at all like those of the two past winters, but vigilance, of course, should not be relaxed on this account, since there are many other European insect pests which would be very dangerous to the United States. This experience which we are going through and the representations which have been made to foreign governments are producing an effect. Belgium has established a service for the inspection of exported nursery stock, under the directorship of Dr. Staes, of Ghent, and, since the publication of the report of the Entomologist which lies before you, word has been received that France has established such a service and has placed it under the charge of Dr. Paul Marchal, a very competent man, who selects his own trained assistants, Dr. Marchal being responsible to the Ministry of Agriculture of France, which therefore becomes practically responsible to the United States for the condition of stock exported to this country. These two facts are encouraging, but by no means obviate the necessity for a competent quarantine and inspection law for the United States.

The large importations of experimental plants carried on by the Bureau of Plant Industry has brought about the necessity for careful inspection for new insect pests, which has been thoroughly done. The foreign plants coming into the District of Columbia have also been inspected, and in January last a lot of 2,000 flowering cherry trees sent by the Japanese Government to the wife of the President was found to be infested by injurious insects new to this country and which could not be killed by fumigation, so the entire lot was destroyed.

Concerning the other aspects of the work of the bureau, I will be glad to answer questions, or the members of the committee can find a much fuller summary in the annual reports before them.

Mr. HAWLEY. What is your judgement of the value of the foreign inspection?

Dr. HOWARD. It varies, Mr. Hawley. The inspection which we have had from France was worth less than nothing. The inspection we are going to get under Paul Marchal will be very competent inspection, but, at the same time, I do not think it could be implicitly relied on. I think we will need a reinspection at the point of ultimate delivery.

Mr. HAWLEY. What about the Belgian inspection?

Dr. HOWARD. The Belgian I have not any confidence in, because Dr. Staes who has been appointed is a botanist and not an entomologist.

Mr. LEE. I would like for you to state briefly what has been done toward stamping out the infection in sugar cane.

Dr. HOWARD. The laboratory has only been established this year, and we are only feeling around, as it were.

Mr. LEE. You have ample appropriation?

Dr. HOWARD. Yes.

Mr. McLAUGHLIN. You spoke of the ravages of the brown-tail moth and gypsy moth in some of the New England states, and suggested the need of a law authorizing the Secretary of Agriculture to forbid the transportation of timber or anything else by which these pests might be carried. I will call your attention to section 9 of the Simmons bill:

That upon complaint or reasonable ground on the part of the Secretary of Agriculture to believe that any nursery stock or other article mentioned in this act grown within the United States and likely to become subject of interstate commerce is infested with injurious insects or diseases new to the United States, the Secretary of Agriculture shall cause the same to be inspected by a qualified expert.

Of course, that says "new to the United States," but if that were changed so as to permit him to forbid the transportation or the entry into interstate commerce of diseases——

Dr. HOWARD. New to other portions of the United States.

Mr. McLAUGHLIN. New to other portions, old districts.

Dr. HOWARD. That would do it.

Mr. McLAUGHLIN. That would be enough, would it?

Dr. HOWARD. I think so.

Mr. McLAUGHLIN. And in order to be sure that the Simmons bill would authorize the Secretary of Agriculture to forbid the importation of potatoes or anything else that is seriously infested, it would be necessary only to change section 3 by the addition of a few words, and to change section 8. Without giving it very much thought I might suggest a change in section 3, the addition of a very few words, in line 14 after the word "to," so it will read:

The Secretary of Agriculture may at any time extend the provisions of this act to agricultural products of any kind, and to fruits and vegetables——

And so on. It might be necessary to add also, whether these things are imported to be used as seed or for commercial purposes.

Dr. HOWARD. I do not see why that would be necessary; it would be covered without it, would it not?

Mr. McLAUGHLIN. Would those conditions meet the requirements and remove the objections that have been suggested to this bill?

Dr. HOWARD. I think so, entirely. I doubt very much whether that would be necessary, even. Section 8 would need no change, if that is inserted in section 3, for the reason that it says, "articles designated in section 3."

Mr. HAWLEY. You mentioned a certain tangle-foot preparation put on trees to prevent the insects climbing up and down.

Dr. HOWARD. Yes.

Mr. HAWLEY. Will you put in the record the formula or formulas?

Dr. HOWARD. I wish we could. It is a proprietary compound, a secret compound, the formula of which is known to one man, who goes into a dark room and prepares the formula, and it is his secret, and he is making a fortune out of it. We have endeavored to get it, but have not succeeded. We have imported similar preparations from Europe, but they are not nearly as effective as this.

The CHAIRMAN. Has he patented it?

Dr. HOWARD. Yes.

The CHAIRMAN. I do not know that it would do any good then to find out the formula.

Dr. HOWARD. We could imitate it, could we not, without duplicating it?

The CHAIRMAN. I do not think that would be quite fair. I do not think you had better spend much money on that.

(Thereupon, at 4 o'clock p. m., the committee adjourned until to-morrow, Thursday, December 15, 1910, at 10.15 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
December 15, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott in the chair.

STATEMENT OF MR. L. O. HOWARD—Continued.

The CHAIRMAN. We will resume this morning the consideration of the estimates for the Bureau of Entomology. Dr. Howard, the chief of that bureau, had completed at our session yesterday his general observations with regard to the work of the bureau, and we will ask him now to take up the estimates in detail. I notice, first of all, that there is an increase of \$500 submitted in the estimate for salary of the chief of the bureau, and out of consideration for the well-known modesty of the said chief we will pass that proposition until the Secretary comes before us. I see that one executive assistant is put into the statutory roll by transfer from the lump sum. How long has the same man been filling that place, Doctor?

Mr. HOWARD. About two years, I think, Mr. Chairman.

The CHAIRMAN. Does that measure the length of his service in the bureau?

Mr. HOWARD. Oh, no. He was in the bureau for at least 15 years previous to that.

The CHAIRMAN. How long has he been getting \$2,250?

Mr. HOWARD. About two years, I think.

The CHAIRMAN. I notice, altogether, by transfer from the lump sum, the statutory roll is increased to the extent of 17 employees. All of these employees have been transferred at the salaries which they now receive, have they?

Mr. HOWARD. I think every one of them; yes, sir.

The CHAIRMAN. The number I have just mentioned does not include the 13 employees who have been transferred from the lump sum for preventing the spread of moths?

Mr. HOWARD. That is true.

The CHAIRMAN. Are those persons employed in Washington or outside of Washington?

Mr. HOWARD. A few of them are employed in Washington. A majority of them are employed outside of Washington—in the headquarters at Boston and elsewhere.

The CHAIRMAN. They are the employees who are doing clerical work?

Mr. HOWARD. Clerical work, and superintendence which does not involve scientific attainments.

The CHAIRMAN. With the exception of these transfers, then, there has been no change in the statutory roll?

Mr. HOWARD. No; none whatever.

The CHAIRMAN. You are not asking for any new places?

Mr. HOWARD. We are asking for no increase and no new positions.

The CHAIRMAN. Passing, then, to the appropriation for general expenses, what is the net increase in your first paragraph, "For investigations of insects affecting deciduous fruits," etc?

Mr. HOWARD. There is a reduction there, Mr. Chairman.

The CHAIRMAN. There is an apparent reduction.

Mr. HOWARD. By transfers. There is no increase whatever asked for in that paragraph.

The CHAIRMAN. The next paragraph is "For investigations of insects affecting cereal and forage plants." There is an apparent increase there of \$10,000.

Mr. HOWARD. That apparent increase is a real increase, because there have been no transfers from that fund to the statutory roll.

The CHAIRMAN. Let us have just a word or two in explanation of the reason for this increase.

Mr. HOWARD. The increase is asked for almost entirely on account of the necessary investigations into this new alfalfa weevil, which is spreading very rapidly through the irrigated portions of Utah and Colorado and the adjoining States and is one of the most serious menaces we have ever had to any crop. The country in which it is at present spreading is dependent almost entirely on the alfalfa crop, and this weevil destroys the plant absolutely. It is a new insect which was not known in this country until about two or three years ago. It is an European species. It probably was imported at Salt Lake City accidentally. The only way we can think of in which it got in is that it must have been brought in upon the straw or other substance used as packing for some articles that came from Europe. It was probably brought in in a quiescent state in the winter time, and it has spread continually ever since. It was not discovered until it had spread to a considerable extent. The State authorities have taken it up and are working on its life history at their experiment station; but they have been unable to do anything of a remedial character of any great value.

Mr. McLAUGHLIN. Do you think it was brought in on nursery stock?

Mr. HOWARD. Very possibly, but it was probably brought in in some other way.

Mr. HAWLEY. Does it affect the alfalfa that grows on dry land?

Mr. HOWARD. Yes; it affects it wherever it can get at it.

Mr. LEE. Does it attack the root?

Mr. HOWARD. No; it feeds upon the leaves.

It belongs to that group of the weevil family that does not feed on the root. It has a slug-like caterpillar—a creature that feeds upon leaves.

The CHAIRMAN. Has your bureau done anything in connection with it?

Mr. HOWARD. Under the general appropriation last year we have been trying to check up the work of the State people, working cooperatively with them. They have tried some experiments. We also tried to introduce there a fungus disease that kills off the allied species, the clover weevil of the East; but in that dry country out there the fungus will not flourish, and will not propagate itself.

The CHAIRMAN. In what sections of the country have you found this weevil?

Mr. HOWARD. I will give you the exact spread, sir. Starting in the region about Salt Lake City, it now occurs in the borders of Colorado, Wyoming, and Idaho. It has spread largely through Colorado, and is on the borders of Idaho and Wyoming.

Mr. HAWLEY. How does it spread?

Mr. HOWARD. It spreads by the flight of the beetle.

Mr. McLAUGHLIN. You say it has spread largely through Colorado. Do you mean that it covers the entire State where alfalfa is grown?

Mr. HOWARD. Not entirely. It occurs here and there, as it has accidentally alighted.

Mr. CHAPMAN. Is it something like the tobacco fly?

Mr. HOWARD. It eats the leaves.

Mr. CHAPMAN. The larva eats the leaves, but not the beetle itself?

Mr. HOWARD. Not the beetle itself; no, sir.

The CHAIRMAN. Have you found out whether it lives on anything else?

Mr. HOWARD. It does not live on anything else, as far as we have found.

Mr. HAWLEY. It does not attack the clover.

Mr. HOWARD. Not as far as we have found.

The CHAIRMAN. The next paragraph apparently provides no increase "For investigations of insects affecting southern field crops."

Mr. HOWARD. No, sir.

The CHAIRMAN. "Including the cotton-boll weevil," etc. "For investigations of insects affecting forests."

Mr. HOWARD. There is the main increase.

The CHAIRMAN. A very large increase is asked for.

Mr. HOWARD. As I remarked yesterday afternoon, after Dr. Hopkins had finished his remarks about the very successful work they had done in regard to the control of the bark beetles, I remarked that this was the large increase that the department was asking for in the appropriation for the Bureau of Entomology. The investigations undertaken by Dr. Hopkins have reached a stage now where he needs men to do these things. The thing is to get the people to do them. The increase is asked for, largely, to employ and train more men, and to do demonstration work through the northwestern country in the forests.

Mr. McLAUGHLIN. Will this work be done largely in the national forests, or will some work be done in cooperation with private owners, and in other forests not included in the national forests?

Mr. HOWARD. As was explained yesterday, Mr. McLaughlin, the private owners are asking for cooperative efforts, and the Forest Service, the National Parks, the private owners, and the Bureau of Entomology have engaged in this large project in Washington and

Oregon already; and we wish to take the thing up in the same way in other places.

Mr. McLAUGHLIN. The reason I ask is, that you say Dr. Hopkins has found the right way to do this work.

Mr. HOWARD. Yes.

Mr. McLAUGHLIN. And it seems to me that where the private forests are infested it is only necessary for Dr. Hopkins or some proper man from your bureau to tell the private owners what to do; and that it is not up to the Government at all to go out and do the actual manual work.

Mr. HOWARD. They do not propose to do the manual work. They supervise and superintend it.

Mr. McLAUGHLIN. I may be wrong in my idea of what the Government ought to do, but that is the reason for my question.

The CHAIRMAN. Following that question, please tell the committee what you expect to do with this additional appropriation.

Mr. HOWARD. Dr. Hopkins's idea, in which I concur, is to get a number of good entomologists added to his branch of the work, to train them in this especial line, and to place their services at the disposal of cooperative experiments between the national parks and the private owners, because where the private owners' forests adjoin the national forests it is necessary that the work should be done in both places, in order to kill out the insects and prevent them from spreading from one to the other. If the private owners do it and the national parks do not do it, the work of the former would be more or less useless, because they would spread immediately from the national parks. Having employed those men and trained them, they are sent out. They go through the forests and pick out the trees that are to be cut and marked or scorched, and then the manual labor is done at the cost of the owners, or at the expense of the Forest Service, as the case may be.

The CHAIRMAN. Do you think it is necessary to employ these highly trained and expensive experts to go through the forests to mark the trees that are to be cut down? I have seen trees that were attacked by the Black Hills beetle in the Colorado forests, and it seems to me I could tell a mile away which trees ought to be cut down.

Mr. HOWARD. I am very much inclined to doubt that, Mr. Scott. [Laughter.]

Mr. LAMB. I am, too.

The CHAIRMAN. Then the instructions given by Dr. Hopkins are not accurate, because he has told us that the fading of the leaves of a pine tree was a conclusive sign that the tree was dead or dying, and should be cut down.

Mr. HOWARD. You have to be able to tell whether the brood is in the tree or not. The beetles might have escaped from those trees that you could see, and you would be wasting time and labor in cutting down those trees.

The CHAIRMAN. How is that detected?

Mr. HOWARD. I can not tell you that. I have not intimately studied this point.

Mr. HAWLEY. Can an expert, by looking at the tree, tell whether there are any beetles or larva left in it?

Mr. HOWARD. Yes, sir; and there is only one period in which you can be sure the brood is there, and that is between September and next

July. That is the time when they must be found. It does not take a man of the highest training. We have two men out there now who have been forest rangers. We are paying those fellows \$1,200 a year. They have become very expert in this work. They came to Washington and studied for a few months with Dr. Hopkins, and they have gone out into the woods with some of his more experienced assistants, and they are perfectly capable of doing the work. It is not a question of employing high-priced and high-grade experts. It is a question of employing men who are thoroughly familiar with this particular thing.

The CHAIRMAN. The greatest good that you expect to obtain from their employment, I assume, would be to inspire greater activity on the part of the owners of forests?

Mr. HOWARD. Yes.

The CHAIRMAN. The next paragraph is "For investigations of insects affecting truck crops, stored grains, and other stored products," where there appears to be a small increase recommended.

Mr. HOWARD. There is an increase, I think, of about \$1,000 there. There is no especial reason for that, Mr. Chairman.

Mr. HAWLEY. In the paragraph at the top of the page there is an insect mentioned there—the Argentine ant.

Mr. HOWARD. Yes.

Mr. HAWLEY. What damage does he effect?

Mr. HOWARD. The Argentine ant is a great nuisance in Louisiana and in portions of California. It is particularly injurious through the fact that it carries scale insects from infested trees to uninfested trees. That is a great damage to horticulture.

Mr. HAWLEY. Does it commit any ravages on its own account?

Mr. HOWARD. It does not, except in houses. It is the most persistent ant we have ever seen. We have not so far been able to suggest a plan of action that is efficacious against other ants that will affect this ant.

The CHAIRMAN. What is the size and color of it?

Mr. HOWARD. It is a small dark-brown ant. The Louisiana people and the people of eastern Texas are very much interested in this. It probably was introduced at the time of the Cotton Exposition, in 1884, in New Orleans. They spread through the city at first, being a great nuisance to the stores and houses. They swarmed at Audubon Park, where the Louisiana experiment station is. At one time they swarmed in the houses to such an extent that it was dangerous to let babies go to sleep in their cradles because they would get in their eyes and swarm all over them. At Baton Rouge they were particularly dangerous and troublesome.

Mr. BEALL. What became of the ant that was brought here to kill the cotton-boll weevil?

Mr. HOWARD. It died out, as we thought it would.

The CHAIRMAN. Why do you call it the Argentine ant? Do you know that it came from that country?

Mr. HOWARD. It was supposed to have come from Argentina, and the name became popular. When a name comes into popular use it is very hard to change it. We are not sure that it came from Argentina.

The CHAIRMAN. Do you say that you have made no special progress in the way of killing it?

Mr. HOWARD. Mr. Wilmon Newell, who is in collaboration with the bureau in this work—the State entomologist there—has a trapping process that he thinks very favorably of, and in Louisiana, where flooding is possible, flooding at the right time will control it.

The CHAIRMAN. You ask an increase of \$1,160 “for investigations in bee culture.” That appropriation has been running along at \$10,000 for a good many years. Is there any particular reason why it should jump now?

Mr. HOWARD. There is no particular reason, except that, as I stated yesterday, the question of bee diseases is to-day more important than anybody suspects.

Mr. LAMB. Bee culture has been going on for a long time. Can you not get through finding out about bees?

Mr. HOWARD. No; there is a great deal to be found out about the honeybee all the while.

The CHAIRMAN. You said yesterday that your investigator had discovered a disease which the bee keepers of the country had never known to exist. Is it likely that a disease is very important which the bee keepers have not discovered to exist?

Mr. HOWARD. Not likely. It would seem so at least. It is, however, an important disease. This is the one we spoke of as the “old” disease. The old brood disease of bees has been found to be much more widely distributed than before. The bee keepers have not been successful, but they have not known why. It is on account of the brood disease. Under the present methods of handling bees and shipping them around indiscriminately from place to place this disease is being spread—and the other “new” disease as well.

Mr. HAWLEY. Do the diseases that attack bees simply attack the increase of the swarm or diminish the activities of the adult bees?

Mr. HOWARD. It diminishes the number of the larvæ in the hive and kills off the brood.

Mr. HAWLEY. But those that remain are still as active as ever?

Mr. HOWARD. Oh, yes.

Mr. LAMB. This white-fly business seems to be going up by leaps and bounds. I can recall when the white fly had a hard time here to get \$5,000 and now you want \$21,000.

Mr. HOWARD. Yes, sir. That is for all insects injurious to citrus fruits, Capt. Lamb. The white fly is only one. There are the orange thrips and the scale insects which are specifically designated.

Mr. HOWELL. Is this white fly the same fly that destroys the beet crops in the West?

Mr. HOWARD. No, sir; this fly is a specific enemy of citrus fruits.

The CHAIRMAN. There is no increase on that particularly.

Mr. HOWARD. No, sir; the \$5,000 that was appropriated for the search of the natural enemy is included in this.

The CHAIRMAN. I notice that you suggest the elimination of the language “for carrying on investigations of the hydrocyanic-acid gas process?”

Mr. HOWARD. That investigation has been completed.

The CHAIRMAN. You would not expect to renew it at any time or place without additional language?

Mr. HOWARD. No, sir.

Mr. LAMB. I congratulate you. That is the first one that has been completed in my time.

Mr. LEVER. You spent the \$16,500 that is carried here in the language, Doctor?

Mr. HOWARD. \$21,500, is it not, Mr. Lever?

Mr. LEVER. It reads:

For carrying on investigations of the hydrocyanic-acid gas process, \$16,500; and for the investigation in this and foreign countries to discover the natural enemy of the white fly and means of employing that for destroying the white fly, \$5,000.

You seem to have used the total appropriation of \$16,500 for the hydrocyanic-acid gas process.

Mr. HOWARD. That is a mistake. We only used \$5,000 last year on hydrocyanic-acid gas.

Mr. LEVER. I was thinking if you had that you would not want the increase you ask for.

The CHAIRMAN. The hydrocyanic-acid gas process had been in use before you began any experiments, had it not?

Mr. HOWARD. It was originally discovered by an agent of the bureau many years ago. It was in use, in a wasteful and comparatively inefficient way by the commercial fumigators of southern California, and our work resulted in a scientific investigation of the best methods of using the gas and the qualities of the substances used, and it resulted in economizing the process very considerably, and in rendering it so complete and so efficacious that it will now have to be repeated only once in two years, whereas previously, under the old wasteful method, they were fumigating twice a year.

The CHAIRMAN. Is it used exclusively to combat scale insects?

Mr. HOWARD. It is used exclusively for scale insects out-of-doors; yes, sir. It is not used for any other purpose except house and mill fumigation.

The CHAIRMAN. As a result of your experiments and demonstrations, it is now in universal use throughout the citrus fruit country, is it?

Mr. HOWARD. In California it is almost universally used.

The CHAIRMAN. Can you give an estimate of the reduction in the expense which you brought about?

Mr. HOWARD. I am sorry that I have not the figures.

The CHAIRMAN. You can not say in a broad way what the percentage of reduction is?

Mr. HOWARD. No, sir; I do not think I have ever heard. The statement has simply been made to me that it has been reduced. That statement was made to me not only by my own assistants, but by practical men in California that I saw last September.

Mr. HAWLEY. I would like to ask about the insertion of the words "scale insects." Have you not had authority to make the investigations in preceding bills?

Mr. HOWARD. Yes, sir.

Mr. HAWLEY. Why use the words that are specifically inserted here now?

Mr. HOWARD. In order to make the use of the appropriation appear more specific, and in order to call attention to everything we are doing in that line, as nearly as possible?

Mr. HAWLEY. If that language went out on a point of order, could you still investigate scale insects?

Mr. HOWARD. Yes, sir; I think so. They come under the head of insects infesting citrus fruits. It would make no difference in the use of the fund if it should go out.

The CHAIRMAN. The next paragraph, "For investigations of miscellaneous insects, inspection work," etc., seems to have a reduction of some nine or ten thousand dollars.

Mr. HOWARD. There has been a very large transfer to the statutory roll from that fund, Mr. Chairman. I do not think there has been any reduction. There may have been a slight reduction by the Secretary at the last moment.

The CHAIRMAN. It is practically the same, you understand, then, as the present appropriation?

Mr. HOWARD. Yes, sir.

The CHAIRMAN. I believe that concludes the estimates of this bureau.

Mr. HAWLEY. There is one on page 64, Mr. Chairman.

The CHAIRMAN. Yes. On page 64 is a paragraph for the prevention of the spread of gypsy moth. The apparent reduction in this estimate, I presume, is accounted for by the transfer of employees to the statutory roll.

Mr. HOWARD. Almost entirely. There was a still further reduction in order to keep the appropriation within even figures, I understood.

Mr. LEVER. Do you know how much of that amount, \$300,000, you spent last fiscal year?

Mr. HOWARD. There was a small balance. I can not remember how much.

Mr. COCKS. The gypsy moth and brown-tail moth are prevalent in other parts of the United States, other than Massachusetts and New England, are they not?

Mr. HOWARD. Not outside of New England.

Mr. COCKS. Not at all?

Mr. HOWARD. Not at all.

Mr. COCKS. I thought they were. For instance, on Long Island we have a butterfly that looks as much like that butterfly [indicating] as can be.

Mr. HOWARD. This one [indicating]?

Mr. COCKS. No; the other one—the brown tail. You do not think he is the same as that one or the gypsy either?

Mr. HOWARD. No, sir.

Mr. COCKS. What is it that affects our apples and makes them imperfect? We have some kind of a moth.

Mr. HOWARD. The codling moth.

Mr. COCKS. The codling moth only?

Mr. HOWARD. Yes, sir.

Mr. LEVER. They would live outside of New England, I suppose.

Mr. HOWARD. Yes; surely.

Mr. COCKS. I have not looked at them carefully, but I know that is a familiar butterfly in our country; but I suppose it has some stripes on it that the other does not have.

Mr. HOWARD. It looks very different to me. You have one that looks more like this [indicating] than that [indicating].

Mr. COCKS. The butterfly of the cabbage worm is white, only it has not the brown tail, I guess.

Mr. HOWARD. Yes.

Mr. COCKS. Have you found out anything further about the cabbage louse, that little insect that is so very destructive to cabbage?

Mr. HOWARD. Nothing except the sprays that we have been advising.

Mr. COCKS. You have no parasites to kill them?

Mr. HOWARD. There are parasites, but we have not discovered any way to encourage them.

Mr. McLAUGHLIN. The testimony taken in the hearing on the nursery bill shows that the gypsy moth and the brown-tailed moth were shipped from one State to another, from Missouri to West Virginia, and that it was found in the nursery stock in Iowa, and so on. It would seem, if the witness who so testified was right, that those moths must be there, although they may not have been getting in their work.

Mr. HOWARD. A most careful investigation has been made of every one of those cases, Mr. McLaughlin. In the case of Iowa, for example, where it was shipped from Iowa to other States, it was on nursery stock that had been imported by the Iowa nursery that same winter. The stock was imported in the autumn and was heeled in and shipped out in the spring. That is the way it came from Iowa to other places; but careful search has been made by the State entomologist in the vicinity of that nursery, and he is convinced that it has not established itself there. That is the case in all of these other instances where the gypsy and the brown-tail moth have been shipped to other States. Neither species has been established anywhere outside of New England.

Mr. COCKS. This appropriation will take care of the cauliflower pest that appeared on Long Island, I suppose. That will come under the head of "destructive diseases"?

Mr. HOWARD. That will come under the head of "destructive diseases."

Mr. McLAUGHLIN. You say the pests have been found in these different places, but that they have not become established. Do you understand that they simply died out, or was some means taken to prevent them from getting in their work?

Mr. HOWARD. In the case of this Iowa nursery the stock was heeled in during the winter, and it was all shipped out, so that there was not any of it left. We traced each shipment to its point of ultimate destination, and there had it inspected and all the insects killed.

Mr. McLAUGHLIN. All killed?

Mr. HOWARD. Yes.

Mr. HOWELL. To what extent have you been successful in preventing the spread of the brown-tail moth and the gypsy moth in New England?

Mr. HOWARD. To the extent indicated by the map which I had here yesterday. The brown-tail moth has spread largely to the northeast because it flies at a time of year when the prevailing wind is from the southwest. It flies at night. To the east it has spread very slightly. The gypsy moth has also made a very slight spread—three or four townships a year. We are not sure whether that has actually spread within the last year or the year before, or whether it has been there for some time and has not been found until just now; but if this work had not been carried on for the past four or five years by the Department of Agriculture there is no doubt at all but that the gypsy moth would have been at this time all over New York State, New Jersey, and perhaps even farther west.

Mr. HOWELL. You have no hope, then, of exterminating the pest entirely?

Mr. HOWARD. I think it has gone beyond the possibility of entire extermination. I do not think it will ever be exterminated. Our hope is that by this work we can keep it within bounds until the parasites we are importing on a very large scale will reduce it to a comparatively harmless species.

Mr. McLAUGHLIN. Have the States and municipalities where the brown-tail and gypsy moths prevail done as much as formerly by way of making appropriations to assist in the work?

Mr. HOWARD. They are doing as much as formerly, but they are not doing enough in the State of New Hampshire. The extent to which the work is being carried on in the different States at present is as follows: In Maine the appropriation is for two years. The legislature in 1909 appropriated \$50,000, or \$25,000 a year for two years. The New Hampshire Legislature in 1909 appropriated \$25,000 for two years. They pay their superintendent \$2,500 a year (or \$5,000 for the two years), which makes the actual amount for the destruction of these insects \$10,000 a year for New Hampshire. The area infested at the present time in New Hampshire is as great as it is in Massachusetts.

Mr. McLAUGHLIN. Do you mean that New Hampshire makes an appropriation of \$5,000 and pays it all to the superintendent?

Mr. HOWARD. They give him \$2,500 a year, and for two years that makes \$5,000. The State of Massachusetts appropriated \$300,000 each year for 1909 and 1910 and \$15,000 additional each year for parasite work. Rhode Island appropriated \$10,000 in 1909 and \$8,000 in 1910; but in Rhode Island they have only one small colony, which is approaching extermination, in the vicinity of the city of Providence. Connecticut has an appropriation of whatever amount is necessary, not exceeding \$10,000. They have only two colonies, and one is practically exterminated and the other almost so.

Mr. McLAUGHLIN. These appropriations are by the State legislatures?

Mr. HOWARD. Yes.

Mr. McLAUGHLIN. I understand that in many of the municipalities of Massachusetts there are appropriations.

Mr. HOWARD. Some small sums are spent by the different towns, but they are very small. Private owners are spending a large amount of money and public organizations in some places are taking subscriptions. Down on the North Shore the private owners, a wealthy class of people, put their hands in their pockets to the extent of \$30,000 last year. They had the money expended under the superintendence of the State forester.

Mr. McLAUGHLIN. The money that has been appropriated by the municipalities in Massachusetts in the past has aggregated a large amount of money.

Mr. HOWARD. That is done under the State law which provides that each town must take care of these pests, and the State reimburses them a certain percentage of the amount that is spent. In that way, it does aggregate a large sum of money for the municipalities.

The CHAIRMAN. Can you get the required amount that will be used during the current year in that way?

Mr. HOWARD. No; I am afraid I can not. These sums I have just referred to will be expended by the States.

Mr. McLAUGHLIN. My recollection is that Mr. Weeks when he appeared before the committee had a statement here showing the aggregate appropriations by the municipalities of Massachusetts, covering a series of years.

Mr. HOWARD. Yes.

Mr. McLAUGHLIN. My recollection is that it reached quite \$1,000,000.

Mr. HOWARD. Yes; it aggregated, I think, \$1,000,000—about that. I remember the statement. I will telegraph to Mr. Rogers and ask him to make me an estimate of the amount, and I will insert it in the record when it comes to me.

The CHAIRMAN. We will be glad if you will. There are many pests of a similar nature to the gypsy moth in this country that would be just as destructive if present in large numbers, are there not?

(The statement is as follows:)

Statement drawn up by D. M. Rogers showing amounts appropriated and expended in the New England States in work against the gypsy and brown-tail moths.

Amount expended by the State of Massachusetts from 1890 to 1900. \$1, 175, 000

Amounts appropriated by the State of Massachusetts from 1905 to 1910:

1905.	75, 000
1906.	225, 000
1907.	295, 000
1908.	300, 000
1909.	300, 000
1910.	300, 000
Additional for parasites:	
1905.	10, 000
1906.	10, 000
1907.	25, 000
1908.	25, 000
1909.	15, 000
1910.	15, 000

1, 505, 000

Amounts expended in Massachusetts from 1900 to 1905 other than the appropriations shown above expended through the State forester's office:

Metropolitan Park Commission.	531, 281
Massachusetts Highway Commission.	30, 815
Metropolitan Water and Sewerage Board.	45, 387
Cities and towns.	1, 351, 235
Property owners (by return made).	577, 372
Estimated other expenditures by individuals, institutions, etc.	600, 000

3, 136, 090

Appropriations by State of Maine (appropriated every two years):

1905.	5, 000
1906.	5, 000
1907.	30, 000
1908.	30, 000
1909.	25, 000
1910.	25, 000

120, 000

Appropriation by State of New York, 1910, to prevent entrance of moths. 50, 000

Appropriations by State of New Hampshire (appropriated every two years):

1907	\$12,500
1908	12,500
1909	12,500
1910	12,500
	<hr/> 50,000 <hr/>

Appropriations by State of Connecticut:

1906, \$800 spent from experiment station funds.

1907-8, \$1,000 or any amount up to \$10,000.

1909-10, \$10,000 for the two years.

Appropriations by State of Rhode Island:

1906	5,100
1907	10,000
1908	10,000
1909	8,000
1910	8,000
	<hr/> 41,000 <hr/>

Appropriations by the Federal Government:

1906	82,500
1907	150,000
1908	250,000
1909	300,000
1910	300,000
	<hr/> 1,082,500 <hr/>

Total..... 7,249,690

There is no way of estimating the amounts expended by cities and towns and individuals in brown-tail work in the States of Maine and New Hampshire during the past five years, nor amounts expended by cities and towns and individuals between 1900 and 1905, when there were no State or other appropriations for fighting either of the two moths.

Mr. HOWARD. That is true.

The CHAIRMAN. Are they controlled almost entirely by parasites?

Mr. HOWARD. They are controlled by parasites and by disease.

The CHAIRMAN. I presume you remember the invasion of insects that we called "maple worms" some 25 or 30 years ago?

Mr. HOWARD. Yes.

The CHAIRMAN. Which were extremely prevalent and destructive for two or three years, and then disappeared utterly.

Mr. HOWARD. Yes.

The CHAIRMAN. How do scientists account for their sudden and complete disappearance?

Mr. HOWARD. That was the result of the work of native parasites. The maple worm is a native worm. There are 20 or more such species in this country, native caterpillars, that will gradually increase for a series of years, and then burst out in a flood. In the meantime their parasites have been increasing right behind them, and then with this tremendous lot of food for the parasites and the enormous number of places to lay eggs, the parasites suddenly increase and wipe out the great army of worms, and then the work begins over again, at the beginning. The next year there are very few of them but they gradually increase, and so on.

The CHAIRMAN. So that the best you can hope for is to hold the gypsy moth within as narrow limits as possible while waiting for the development of parasites?

Mr. HOWARD. Yes, sir.

Mr. HAUGEN. How do you account for what happened in the case of the chinch bug and grasshopper?

Mr. HOWARD. The chinch bug is killed off by disease when it appears in numbers. It has two diseases. One is a bacterial disease and the other a fungous disease. They are always existent, but whenever the wet season comes it practically wipes the species out, leaving only a few survivors in a damp season which is favorable to the increase of the fungous disease.

Mr. HAUGEN. How about the grasshoppers, then?

Mr. HOWARD. The migratory grasshopper no longer devours western crops, because its permanent breeding grounds have been settled. These great swarms that came to us were dependent upon the wild and more or less arid conditions of the far Northwest. That is the kind of locality that is favorable to it. When it became so abundant that there was no food left for it, it migrated to Kansas and Colorado.

Mr. HAUGEN. We have another kind, too.

Mr. HOWARD. Yes, sir; but it is not migratory. It is one of the short-wing species. It is not especially dangerous.

The CHAIRMAN. When the grasshopper left Kansas, where did it go?

Mr. HOWARD. Back to its permanent breeding grounds in Montana and Dakota.

The CHAIRMAN. Where does the name "seventeen year locust" come from? Was it the theory that it took 17 years to breed in sufficient numbers to make migration necessary?

Mr. HOWARD. That is not a grasshopper at all.

The CHAIRMAN. But the so-called grasshopper which invaded Kansas in 1874 and remained there during 1875 and until the 18th of June, 1876, was called by scientists there, unless I am mistaken, the seventeen year locust.

Mr. HOWARD. It may have been called that by nonscientific people, but I doubt very much if it was called that by scientific people. That is a misnomer.

The CHAIRMAN. Is there such a thing as a seventeen year locust?

Mr. HOWARD. Yes; that is the Cicada septendecim—one of these little creatures that drums in the trees. It does have a larval existence of seventeen years, and then comes out.

Mr. CHAPMAN. It is not very destructive then?

Mr. HOWARD. No, sir; it is comparatively harmless.

The CHAIRMAN. It stays in a larval state for seventeen years before it comes to maturity?

Mr. HOWARD. Yes.

Mr. HOWELL. The alfalfa weevil has been causing a great deal of alarm among the farmers in my State. Have you been successful in your efforts to check its ravages?

Mr. HOWARD. No, sir; a bulletin has just been published by the Utah station, by Mr. Titus, and that gives the exact condition of affairs at the present time, with suggestions.

Mr. CHAPMAN. The ordinary grasshopper of the Mississippi Valley is an entirely different species from the grasshopper, the destructive grasshopper, of the Northwest?

Mr. HOWARD. Yes, sir. The destructive grasshopper of the Northwest has long wings, and is capable of sustained flight for

hundreds of miles. The ordinary grasshopper of the Mississippi Valley has very short wings, and can not fly very far.

Mr. BEALL. What faith have you that you will find a parasite that will control the boll weevil?

Mr. HOWARD. I think we are on the point of getting something very practical there. We have increased the death rate among the weevils, up to about 50 per cent, by importing parasites in two or three cases. If you kill off half of them there is something gained.

Mr. BEALL. Have you introduced those parasites into the different sections where the weevil is?

Mr. HOWARD. We are doing it all the while.

Mr. LAMB. Where did you strike on the resistant?

Mr. HOWARD. The parasites?

Mr. LAMB. Yes.

Mr. HOWARD. We got them mostly from Texas. We have no parasites of the cotton-boll weevil that are successful that we got from any other country, although we searched in Cuba and Central America very thoroughly. The native parasites have taken to the cotton-boll weevil, and are doing so more and more.

The CHAIRMAN. I notice a number of employees under your moth fund are designated as "agent and expert." Just what do they do which renders the use of that word "agent" necessary?

Mr. HOWARD. I do not know that there is any need for the word "agent." These men are expert entomologists, most of them connected with the introduction of parasites. They are experts on parasites.

The CHAIRMAN. Are all of these men who are designated "agent and expert" employed in the introduction of parasites?

Mr. HOWARD. All but one, I think, are employed either in the introduction or in the study of parasites—I think all but one, and he is an expert on the order of insects to which these two moths belong.

The CHAIRMAN. Are there any further questions on the part of the committee? Is there anything further you desire to submit, Doctor?

Mr. HOWARD. No, sir.

The CHAIRMAN. We are very much obliged to you, Dr. Howard, for your attendance here.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 15, 1910.

MORNING SESSION (CONTINUED).

BUREAU OF BIOLOGICAL SURVEY.

The CHAIRMAN. We will proceed now to the consideration of the estimates for the Bureau of Biological Survey. Mr. Henshaw, the chief of that bureau, is present, and I will ask him first to present in a general way the work of the bureau during the past year.

**STATEMENT OF MR. HENRY W. HENSHAW, CHIEF OF THE
BUREAU OF BIOLOGICAL SURVEY.**

Mr. HENSHAW. During the year the Biological Survey continued its investigations along three principal lines:

(1) Game preservation, including enforcement of the Lacey Act, and the care of bird and mammal reservations.

(2) Investigation of the food habits of birds and mammals, with especial reference to their practical bearing on agriculture, horticulture, and forestry.

(3) Biological investigations, including a study of the habits, relations, distribution, and migrations of animals and plants, and the preparation of life and crop zone maps.

GAME PRESERVATION AND INTRODUCTION.

In recent years our big game animals, once so abundant and widespread, have rapidly decreased in numbers, and unless they are carefully protected venison will soon become a high-priced luxury instead of a common article of food. Game, one of our national assets, is worth millions annually, and it should be carefully conserved. The present value of game killed each year in the six New England States is \$1,000,000. The value of game annually killed in the United States is at least \$15,000,000. During the year 1909, 58,000 deer were killed east of the Mississippi River. By means of national forests, national parks, game preserves, and proper legislation the rapid decrease of our game animals is being checked and perpetuation assured.

Every effort has been made during the year to stimulate action of the several States to protect game and to aid in solving the various protection problems that have arisen. In this connection we continue to urge the raising of venison for market by farmers and others, under the belief that as elk and deer can be reared on land worth next to nothing agriculturally, and as 20 deer can be raised on the feed of 1 cow, the business can be made profitable to the farmer. An

added advantage of deer raising is the fact that deer and elk in inclosed forest tracts render valuable service by eliminating brush, and so prevent forest fires. A bulletin on this subject has been sent to the printer and will soon be published.

INTERSTATE COMMERCE IN GAME AND PLUMAGE.

The strengthening of the federal law regulating interstate commerce in game and plumage (Criminal Code, secs. 242-244), which took effect January 1, 1910, greatly increased the responsibilities of the Biological Survey. Limited appropriations have necessitated confining operations to the principal centers of illegal traffic in the Middle West. Attention has been largely concentrated on shipments passing through Chicago and St. Louis, and through cooperation with State officials at these points for several years the situation is now fairly under control. Coincident with the improvement in the laws has been a marked decrease in the total amount of game handled and a change to more elusive methods of shipment, thus increasing the difficulty of enforcing the federal law.

Since January 1, 1910, investigation has been made of the present status of the game traffic in various parts of the country, involving personal examination of the conditions in Los Angeles, San Francisco, Salt Lake City, Denver, Kansas City, St. Louis, Chicago, Milwaukee, Indianapolis, Cincinnati, Columbus, Buffalo, New York City, Philadelphia, and Washington. The plumage trade in most of these cities has also been investigated and assistance rendered State officials wherever possible.

A much larger field force of inspectors is needed to enable the bureau to examine shipments, not only in large centers, but also at smaller places—important points of original shipment—many of which are not now adequately inspected by State officers. During the season when game is not shipped these inspectors could be utilized in connection with the plumage traffic. For this service a small but well-trained force is necessary to work in cooperation with State officers. Provision for such a force is urgently needed for suppression of illegal interstate commerce in game and plumage.

IMPORTATION OF BIRDS AND MAMMALS.

Excellent service was rendered during the year by our inspectors at ports of entry in keeping out noxious birds and mammals, especially the dangerous mongoose, two of which were denied entry and one was traced out and killed after being smuggled in. Nearly a half million birds were imported into the United States during the year. This great number shows how important is the duty of inspection to prevent the entry into the country of species that may become pests.

Mr. STANLEY. You speak of the "dangerous mongoose." What is the danger from it?

Mr. HENSHAW. It is a small animal, not very much larger than our native weasel, but it is exceedingly destructive. It destroys game birds and every bird that it can master—even barnyard fowls. It destroys also snakes, insects, and small mammals. It was introduced into Jamaica years ago, to exterminate the rats that infested

the sugar plantations there, and it practically destroyed most of the birds on the island that nested on the ground, and a great many lizards that were valuable because they lived on insects. After spending many thousands of dollars to exterminate them, the islanders gave it up, and it practically possesses the land.

The CHAIRMAN. They have had practically the same experience with it in Hawaii; I understand that there are hardly any birds on the islands at all, and I have been told that it is due to the presence of the mongoose.

Mr. HENSHAW. The case was a little better in the Hawaiian Islands. Originally they did not have many ground-building birds, but a number of valuable species were introduced, like the turkey, the California Valley quail, and the common domestic fowl, which had run wild and which were shot as game. It has exterminated practically all of this game.

Mr. HOWELL. What could be the possible motive for wanting to introduce a thing like that into this country?

Mr. HENSHAW. We have had a good many inquiries as to the probable value of the animal in Louisiana as a rat exterminator. The rat does not do anything like the damage in the cane fields of Louisiana and Texas that it does farther south and in the Tropics, but still it does considerable damage. It has also been asked whether it would not be a good thing to introduce it into the rice fields. Rats are supposed to do a great deal of damage in the rice fields. Then, a certain number are brought in as pets. Several attempts have been made to bring them into San Francisco, and every now and then we stop one in New York. Occasionally one is smuggled in. For instance, last year one turned up in a poultry yard in Massachusetts. The farmer shot it, and as the animal was strange to him, he sent it to a naturalist and the naturalist sent it to us for identification. It proved to be a mongoose, and it probably came from Jamaica. How it reached the State of Massachusetts is an enigma.

Mr. CHAPMAN. Are they any good?

Mr. HENSHAW. No, sir; they have no value whatever in this country, but on the contrary would prove an unmitigated pest. They are a native of India and there they apparently do not do so very much damage.

Mr. HAWLEY. How does it destroy the birds?

Mr. HENSHAW. They devour the eggs and nestlings, and in the case of ground-feeding birds they surprise many of them in the act of feeding.

Mr. McLAUGHLIN. Does it climb the tree and get at nests?

Mr. HENSHAW. Its powers of climbing are rather limited, but in the Hawaiian Islands I have seen them climb trees. About 20 feet marks the limit.

Mr. HOWELL. Is there no law prohibiting the importation of such animals?

Mr. HENSHAW. Certainly there is a law, the violation of which subjects the shipper, carrier, and consignee each to a fine not exceeding \$200.

The CHAIRMAN. I expect that Kipling's story, "Riki-Tiki-Tair," had something to do with people introducing them as pets.

Mr. HENSHAW. I think very likely that is so. It is a pretty story.

The CHAIRMAN. It probably presents the mongoose in the best light in which he is capable of being shown.

Mr. HENSHAW. Very probably; although it is to be said that it is a determined foe of snakes. There is no doubt about that.

The CHAIRMAN. You may resume your statement.

STARLING INVESTIGATION.

Mr. HENSHAW. The starling was introduced into New York about 1890. It is believed to be increasing and spreading to an alarming extent. During the year an agent of the department made a thorough investigation of its present status and its food habits with a view to the recommendation of restrictive measures.

The starling has proved to be exceedingly destructive in Australia where it was imported for supposed benefits that it might confer, and I think that wherever it has been brought into a foreign country it has proved more or less destructive. We are very much afraid of it. We have been watching it very closely, and the time has probably come now when measures must be taken against it.

The CHAIRMAN. In what way is it destructive?

Mr. HENSHAW. It is a grain and small fruit eater. It also attacks apples and pears, and it will undoubtedly affect the farmers' interests injuriously.

Mr. COCKS. Does it not eat insects at all?

Mr. HENSHAW. To some extent, especially during the breeding season, when it feeds its young on insects, but mainly it is not beneficial. It is a question of balancing the good with the harm. Most birds do some harm. Even if they are exclusively insect eaters they eat some beneficial parasitic and predatory insects that destroy other noxious insects. So we try to strike a balance and determine whether a bird does more good than harm.

The CHAIRMAN. Proceed with your statement.

NATIONAL BISON RANGE.

Mr. HENSHAW. During the year an inspection was made of the Montana Bison Range. Thirty-seven pure-bred buffalo were placed on the reserve last year and 11 calves were born this year. The range is strongly fenced, is covered with nutritious grass, has an abundance of fine water, and in every respect is an ideal range for buffalo and also for elk, antelope, and deer—animals which it is hoped to place on the range in the near future. There are now on the range a few white-tailed deer and 50 buffalo, all in fine condition. Even if no new blood is added to the herd, it is believed that the present animals, living as they do practically in a state of nature under almost ideal conditions, will in time multiply to the limit of the pasturage. This should support at the very least 1,000 buffalo, in addition to a reasonable number of deer, elk, antelope, and possibly mountain sheep.

Mr. CHAPMAN. How large is that range there?

Mr. HENSHAW. It contains about 18,000 acres—a little less than 20,000 acres.

The CHAIRMAN. How many cows are there on the range?

Mr. HENSHAW. There are 24, I think, now.

The CHAIRMAN. Nearly half of the herd are bulls?

Mr. HENSHAW. Twenty-four and 13 was the original introduction. There are 13 bulls, but several of those are young, and it will be some time before they come into service.

Mr. STANLEY. Is the proportion of males to females necessarily greater with the buffalo than with ordinary cattle?

Mr. HENSHAW. No, sir; on the contrary. The larger and stronger bulls do not allow the younger bulls about during the mating season.

Mr. CHAPMAN. How long does it take a buffalo to come to maturity?

Mr. HENSHAW. I think about three or four years.

Mr. HOWELL. Eleven calves is a small increase for twenty-four cows.

Mr. HENSHAW. Well, that was the first year. The herd had not become habituated to the range, probably.

The CHAIRMAN. Did all of the calves that were born live?

Mr. HENSHAW. So far, every one; and they are all very fine and healthy animals.

The CHAIRMAN. Proceed with your statement. We will discuss the details of the appropriation when we reach it.

NATIONAL BIRD RESERVATIONS.

Mr. HENSHAW. Fifty bird reservations, scattered from Florida and Porto Rico to Alaska and Hawaii, are now in charge of the Biological Survey. To facilitate administration these reservations have been divided into six districts, known as the Gulf, Lake, Mountain, Pacific, Alaskan, and Hawaiian. Eighteen—more than one-third of the total number—are on reservoir sites of the Reclamation Service, and on several of these where construction work is still under way conditions are not yet favorable for occupancy by birds. Wardens have not yet been appointed for them or for several other of the more remote reservations. The total number of wardens on the rolls of the department is 15, but since through the cooperation of the National Association of Audubon Societies nine other reservations have been patrolled, about half the reservations have received protection during the year. As warden service must soon be extended to several other reservations the small appropriation now available will be entirely inadequate. Wherever possible, these reservations are utilized, not merely for game propagation, but also as field laboratories for the study of certain problems connected with the economic relations of birds. The food habits of certain water birds are being investigated on the reservations on the east coast of Florida, and on the Tortugas Reservation problems in migration have been studied in cooperation with the Carnegie Institution. Other reservations will be similarly utilized.

I have a number of photographs here which I think the committee will be interested in as showing the character of the land about these reservation sites and of what little use it is except for this purpose.

Mr. CHAPMAN. Does the Government furnish private owners with animals? Is there any method by which a private owner could get buffalo, deer, antelope, or elk from the Government?

Mr. HENSHAW. Not as yet. The Government does not own enough of them. I think the entire number owned by our Government is about 175. The Canadian Government owns more. It has about

600. The Pablo herd, the largest herd in the United States, was sold to the Canadian Government rather more than a year ago. Pablo contracted to deliver to the Canadian Government 600 animals at \$245 apiece. As a matter of fact, he actually did deliver 400, and he still has 75 on his hands. He can not catch them; they are too wild. The bulls are rather dangerous, and he can not shoot them, because the State of Montana has a law prohibiting the shooting of them.

The CHAIRMAN. So he can neither deliver them dead nor alive?

Mr. HENSHAW. He is extremely anxious to have somebody take them off his hands, and he would be willing, I think, to give them to us; but we can not catch them any more than he can.

The CHAIRMAN. I suppose you have no practical economic purpose in view in preserving these buffalo? It is merely a matter of scientific and natural history interest?

Mr. HENSHAW. This herd, the Montana national herd, was presented to the Government by the National Bison Society, and the sole object was the perpetuation of this American animal; but when the herd grows large enough to make it possible it may well form the nucleus for some economic experiments. There is no doubt that the cross between the domestic animal and the buffalo is stronger than our draft animals, but at the same time it is less tractable and the question is whether, by careful selection, a strain can not be produced which will be tractable enough for service and at the same time have the strength and endurance of the bison.

Mr. HAWLEY. What about the fertility of the cross breeds?

Mr. HENSHAW. I understand they are fertile.

Mr. CHAPMAN. At \$245 a piece, it looks as if they could be raised on cheap land at a profit.

Mr. HENSHAW. I think that so far it has been profitable; but they require a tremendous range. They are not easily confined, and apparently many of those who have gone into the business are rather glad to get out of it.

Mr. COCKS. What do you know about the experiments of Buffalo Jones, in the Grand Canyon Reservation.

Mr. HENSHAW. I do not know, personally, much about them.

Mr. COCKS. He has been quite successful in crossing.

Mr. HENSHAW. Yes; he has crossed successfully, but I think the trouble has been that the crosses were not tractable.

Mr. COCKS. He did not expect to make draft animals of them, did he? He expected to make them valuable animals, to live on land that would not support the ordinary steer.

Mr. HENSHAW. I think that was his main object. Nevertheless, I think many of the breeders have had in mind the possibility of making draft animals of them.

Mr. COCKS. I did not so understand it when he was before the committee. He thought they would be valuable for their hides.

Mr. HENSHAW. They are.

Mr. COCKS. And that they would stand climatic conditions that the ordinary domestic steer or cattle could not stand.

The CHAIRMAN. I think the most discouraging feature of his experiment was that no hybrid males were produced, and that the female hybrids did not become fertile until the buffalo blood in them was reduced to one-eighth. I would like to call your attention for a moment to this reservation on the Shoshone project of Wyoming,

just to ask what kind of birds frequent this rocky gorge that you have a photograph of.

Mr. HENSHAW. I think that when the project is completed a great many ducks will stop there in passing.

Probably those reservations and reclamation projects will not furnish many breeding sites. Some of them, no doubt, will; but in the main their value will be as sanctuaries where water fowl can stop and not be molested.

Mr. CHAPMAN. Did I understand you to say a while ago that you could raise 20 deer on the feed of 1 cow?

Mr. HENSHAW. That is what we estimate. Of course the deer is largely a browser.

Mr. HAWLEY. How much meat would there be on 20 deer, as compared with the meat on a good cow or steer?

Mr. HENSHAW. A Virginia buck, about four or five years old, will dress from 125 to 200 pounds. I have seen them dress 200 pounds.

Mr. LAMB. It takes a large deer to do that.

Mr. HENSHAW. Yes. A 200-pound animal is, of course, very rare except in the Northern States, where the animals reach a large size.

Mr. LAMB. About 125 pounds.

DESTRUCTION OF NOXIOUS MAMMALS AND BIRDS.

Mr. HENSHAW. The investigations that center round the economic relations of our native birds and mammals possibly form the most important part of the work of the Biological Survey, and we are pushing as rapidly as possible the examinations of the stomachs of birds to determine the food they eat and are also conducting experiments as energetically as possible to destroy noxious mammals.

GROUND SQUIRRELS IN CALIFORNIA.

Important field investigations were made during the year to find cheap and effective methods of poisoning ground squirrels.

I think the committee will be glad to see one of these squirrels. I am going to speak about the plague animals. This is the plague-infected squirrel of California. [Indicating.]

The CHAIRMAN. That has been disinfected, I suppose.

Mr. HENSHAW. That has been disinfected. Here is an allied species [indicating]. There are 30 or 40 species of ground squirrels, more or less like these.

The CHAIRMAN. In that connection I read an article last night by a San Francisco physician in which he stoutly maintained that there never had been a case of bubonic plague in San Francisco, and that this alarming cry about the squirrels having been infected with the plague had no foundation in fact and was inspired by scientific gentlemen connected with the Government service, who wished to magnify their office and increase their appropriation.

Mr. HENSHAW. Did the gentleman explain what killed the seven boys and farmer who handled the ground squirrels in localities where the plague could not be traced to any other source? We have done no bacteriological work, of course, in connection with this plague matter, and we know absolutely nothing about it except through the work of the Public Health and Marine-Hospital Service.

The CHAIRMAN. I will say, in order to exculpate your bureau, that it was the Marine-Hospital Service that was criticized, and not the Biological Survey; and the answer which the writer made or would make to the question you have just asked is that the diagnosis of the disease which killed these men was not satisfactory and conclusive.

Mr. STANLEY. Have you conclusive proof that the disease which took these men off, which so closely resembled bubonic plague, was contracted from handling these animals? If that is the case, it looks as if they are dangerous animals whether they are infected with bubonic plague or not. If any other disease that will kill a man is contracted from a parasite on these animals, it is a matter of serious concern.

Mr. HENSHAW. As I understand it, the disease in these 10 cases was diagnosed beyond peradventure in the minds of the Public Health assistants who examined the squirrels.

Mr. STANLEY. The point I am bringing out is this: What proof did the Marine-Hospital Service give you that the men contracted the disease from handling the squirrels? That looks like a more material inquiry than even the diagnosis of the disease.

Mr. HENSHAW. These cases were all in the interior of the State, where they could not have been, as far as known, infected from fleas that had harbored on rats; and in each case, as I understand it, the boy or man had killed ground squirrels and carried them home. That seems to connect the plague, or whatever the disease was that killed them, directly with the animals; and, as I understand it, in these cases where the experts find the plague, they substantiate the finding by innoculating guinea pigs or other animals and producing the plague in them; and they do not consider the case proved until they have done that. So there would be very little chance of there being any mistake.

Mr. STANLEY. Does the disease develop immediately after being bitten?

Mr. HENSHAW. No, sir. I have forgotten the number of days, but it takes a number of days for incubation.

Mr. BEALL. Do they carry the plague just like the mosquito does the yellow fever?

Mr. HENSHAW. The flea does.

Mr. LEVER. Is that fact proven beyond a doubt?

Mr. HENSHAW. I think there is no doubt about that. The probable way that these ground squirrels are infected with the plague is from rats. The rats occasionally no doubt run into squirrel holes and leave fleas. The fleas that infest the ground squirrels are closely related to the ones that infest the rats, and they interchange hosts. The squirrel flea will live on a rat and the rat flea will live on a squirrel, as I understand it, and either of them will bite human beings, although I do not think they will live permanently upon them.

Mr. McLAUGHLIN. Were the men and boys who were infected bitten by the ground squirrels?

Mr. HENSHAW. No. They must be infected by the insects. In this case it was the flea that harbors on the squirrels. All the squirrels have fleas.

Mr. CHAPMAN. The squirrel itself does not take the plague, does it, from the bite?

Mr. HENSHAW. It does, and no doubt frequently dies from it.

Mr. COCKS. If a squirrel was infected with the plague, and bit somebody, would not the person bitten get it?

Mr. HENSHAW. No, sir; probably not.

Mr. COCKS. I thought that somebody before the committee spoke about a man being bitten by a squirrel, and dying soon afterwards.

Mr. HENSHAW. I have not heard of such a case. I hardly think it probable.

Mr. BEALL. It might have given him hydrophobia.

Mr. LEVER. This flea does not live on anything except this ground squirrel for any length of time, does it?

Mr. HENSHAW. It will probably live on rats for a considerable length of time, and so will the rat flea live on squirrels, although, naturally, each has its own flea that is parasitic on it.

Mr. LEVER. Is that the house rat or the wood rat?

Mr. HENSHAW. The house rat. I am going to speak about the wood rat. That is the only other native wild mammal except the ground squirrel that has been infected with the plague; and they have found thus far just one individual; but I thought the committee would be interested to know of the different types of animals that have been found infected.

The CHAIRMAN. Suppose you finish your general statement and then when we come to the paragraph relating to this subject, we will ask you some questions.

Mr. HENSHAW. Collectively over sixty species of ground squirrels inhabit 2,000,000 square miles; the destructive species occupy 528,000,000 acres, of which 115,000,000 are in crops and 413,000,000 in range. We estimate the annual loss from these animals to be \$12,000,000. As an example of the destructive work of ground squirrels, I may state that last May by burrowing into an embankment they caused such a serious washout in the Turlock Canal in Stanislaus County, Cal., that the line of the canal had to be changed at a cost of \$25,000. The labor of rebuilding the waterway occupied about three months, thus depriving the ranchmen of water at the time most needed for irrigation of alfalfa and other crops and entailing a loss of upwards of half a million dollars.

That was very likely the work of less than a dozen ground squirrels. Then the water seeped through and started a washout. Here we have illustrations of the work done in irrigation canals and embankments by ground squirrels. [Referring to photographs.]

GROUND SQUIRRELS AND PLAGUE.

The Public Health Service has found plague-infected squirrels in California over an area of 20,000 square miles, leaving 68,000 square miles still to be examined experimentally. A total of 312 squirrels have thus far been found infected with plague and at least 10 human beings have contracted the disease from squirrels through the agency of fleas, and 7 have died. The most essential point, however, connected with plague-infected squirrels is, not so much the danger of present infection of human beings as the likelihood that the disease may become permanently endemic among the California ground squirrels as it is among the squirrels of India, and, as in India, that it may assume a virulent form at longer or shorter periods, and thus produce epidemics among human beings.

The only other native mammal beside the ground squirrel known to have contracted plague is the wood rat, and so far the disease has been discovered in one individual only. While it is believed to be impossible under present conditions to absolutely exterminate an animal so numerous and so widely distributed as the California ground squirrel, it is believed to be feasible to so reduce its numbers as to render it practically harmless. This result, however, is contingent on securing the cooperation of landowners, and it is believed that this can be done under the present State law, provided the State will furnish poison to farmers at cost.

Passing now to methods of destruction, it may be stated that as a result of many experiments we have found a much cheaper and more effective method of poisoning than has hitherto been known—the starch-barley-strychnine preparation. The plan we adopted last season was to offer the services of one of our experts to demonstrate our methods of destroying squirrels, provided large ranches or a number of small ranchmen would agree to cooperate in a scheme of poisoning. Thus on the Poso ranch, consisting of 150,000 acres near Bakersfield, one of our men spent 12 days demonstrating methods of destroying ground squirrels, at a cost to the survey of less than \$75. So far the superintendent of the ranch has distributed poison over 33,000 acres of alfalfa, at a cost of \$3,282, or an average of 7.2 cents per acre.

I may pause a moment to say that this cost is very large; much greater than the average. We figure that in most parts of California the agricultural land can be poisoned thoroughly and the ground squirrels practically exterminated at a cost of about 4 cents per acre. In this particular case the alfalfa was very thick and the area difficult to poison.

Mr. HAWLEY. What do you distribute the poison on?

Mr. HENSHAW. Preferably on barley, because that is not picked up by birds. If you distribute poisoned wheat, as has been the practice generally among the California farmers, the birds eat it and it kills a large number of them, so that we discourage the use of wheat and substitute barley, which is even more effective for poisoning squirrels and very much safer.

Mr. HAWLEY. What do you poison the barley with?

Mr. HENSHAW. We boil starch and add strychnine to it until the strychnine is carried in suspension, and then stir that into barley and dry it. It takes only three or four hours to complete the process, and the poisoned barley can be prepared by any farmer at a cost of about 20 cents per gallon. The proprietary preparations which are usually sold to the farmers in California cost from 60 cents a gallon to \$1, so we claim to have made a very material saving. We think that in this work the State should cooperate with the farmers; when a law is passed compelling the farmer to destroy ground squirrels the State, as was done in Kansas, ought to help by furnishing the poisoned bait at cost price.

Mr. HOWELL. In the State of Utah the legislature has provided a bounty of 1 cent for each squirrel destroyed. I would like to ask if the ground squirrel in Utah and Wyoming is the same species as the ground squirrel in California?

Mr. HENSHAW. No, sir; they are different species.

Mr. HOWELL. It is one of the most destructive pests we have to contend with.

The CHAIRMAN. In a country that you would call thickly infested with squirrels, how many would there be to an acre?

Mr. HENSHAW. About five burrows to an acre, or from 10 to 40 squirrels, depending on the season, we would call a pretty thickly infested area.

Mr. STANLEY. Are they an unmitigated evil? Is there any useful purpose that they subserve at all?

Mr. HENSHAW. They are excellent eating; but the habit of poisoning them has now prejudiced the public against them. They do not eat them very much; but in the interior of the State some are killed to eat.

Mr. HOWELL. That answers the question that I had in mind, which was, What was the purpose of the Californians in carrying the squirrels home?

Mr. HENSHAW. The boys probably intended to have them cooked.

On the Pueblo Indian Reservation 2,000 acres poisoned was distributed by our demonstrator at a cost, exclusive of labor, of 2½ cents per acre. It is believed that the agricultural and pasture lands of the State of California generally can be treated thoroughly and the squirrels practically wiped out at an average cost of not more than 4 cents per acre. A circular (No. 76) on the California Ground Squirrel has just been issued and distributed.

GROUND SQUIRRELS AND SPOTTED FEVER.

In its mild form spotted fever occurs over much of the northern Rocky Mountain region. In Bitter Root Valley, Mont., it annually recurs in an exceedingly virulent form and is a serious handicap in the utilization of the fertile lands of that valley, especially on its western side. In no year has there been more than 2 per cent of recoveries, and during the past year not a single case recovered. The cooperation of the Biological Survey, in connection with the Bureau of Entomology and the State authorities of Montana, was requested to investigate the source of the fever which was believed to be communicated by ticks found on some of the native mammals. Accordingly two of our men spent several months collecting the mammals of the region and studying their habits with reference to the problem. The ticks discovered were turned over to specialists for examination. Fifteen species of mammals were found to harbor the supposed fever ticks either in the immature or adult form. The one on which they were most frequently found is the large Columbia ground squirrel; one of these carried 62 ticks, another more than 100. For the transference of the ticks to places where they can reach human beings, horses and cattle are largely responsible, and unquestionably remedial measures should take into account this ascertained fact. The result of the seasons work can not fail to throw light on the nature of the disease and the means by which it is communicated to man.

Our work was confined chiefly to determining what wild animals were instrumental in carrying the ticks from place to place.

PRAIRIE DOGS.

Our annual loss from prairie dogs is not far from \$2,500,000. The Texas colony occupies 25,000 square miles and contains upward of 400,000,000 animals. Thirty-five prairie dogs eat as much as one sheep, and 210 as much as a cow. On this basis the Texas colony consumes the forage of 800,000 head of cattle or of 4,000,000 sheep. During the past season many experiments with poisons were made in Colorado, Wyoming, Kansas, New Mexico, and Arizona to find the best and cheapest way to kill these destructive rodents. It was ascertained that one-tenth of a grain of strychnine is sufficient to kill a prairie dog, and that winter is the best season for conducting poisoning operations.

As showing effective headway can be made against this pest, it may be stated that in 1901 prairie dogs were regarded so serious a menace to crops and pastures in western Kansas, that the State legislature appropriated \$5,000 to devise means for their destruction. Fully 2,500,000 acres of land were infested with the animals. A vigorous campaign was started, aided by the legislature and the cooperation of the State Experimental Station, and at the present time the area infested by these mammals does not exceed 200,000 acres.

The remainder are located mostly in counties and townships that took little interest in the work of destruction, that is where individual rather than township action was the rule.

The merits of our starch-barley preparation used in California on ground squirrels was compared with the Kansas formula. No difference in efficiency was noted, but our preparation is preferable, because simpler to make and cheaper. These particular experiments were undertaken as a basis for actual work this coming summer in exterminating prairie dogs on and near our national forests. Hitherto we have not had funds for this work and it has been undertaken by the Forest Service. In connection with this, we plan to do demonstration work in the several States whenever the localities infested by prairie dogs are near our bases of operations.

I expect that most of the committee are familiar with the prairie dog—

Mr. LEVER. Is there anything in the idea that the rattlesnake is a boon companion of the prairie dog? We used to see pictures of that.

Mr. HENSHAW. On the contrary. The rattlesnake lives among the prairie dogs; but when a snake enters a hole some of the young prairie dogs never come out, except in the belly of the rattlesnake. The snakes feed on the prairie dogs; and so do the owls that inhabit prairie-dog towns.

POCKET GOPHERS.

More than 40 species of pocket gophers inhabit the United States. Collectively they occupy 1,800,000 square miles, and cause a loss annually of approximately \$12,500,000. The annual loss in Kansas alone is not less than \$600,000. They destroy alfalfa, tubers, and fruit trees, and also cause disastrous breaks in irrigation ditches and embankments. As they live an underground life the problem of

ridding large areas of them is always serious, particularly as methods that work well in one locality fail in another, owing to different habits of the several species, and different soils they inhabit. During the past year we continued experiments to improve and cheapen methods, and work to this end is being carried on at the present time in Kansas.

SEED-EATING MAMMALS IN RELATION TO FORESTRY.

The rapid diminution of our forests by cutting and through the agency of forest fires and the increased demand for lumber, together with the increasing cost, enforce the necessity of replanting treeless areas in our national forests and so to provide for future needs. The Forest Service is pushing this work vigorously and it has been found that, wherever replanting operations have been attempted, from 35 to 75 per cent of the seed is dug up and eaten by small mammals, chiefly spermophiles and mice. This loss is so great in some places as to be prohibitive of the work, and accordingly the cooperation of the survey was asked with a view to providing a remedy. At first investigations were made to find a coating for the seeds which would render them distasteful to rodents, as various coal-tar products, copper, sulphate, and red lead, all of which proved unsuccessful. Poisoning the mammals responsible for the damage with barley coated with starch and strichnine, where there is little or no moisture, and with tallow and strichnine, where there is much rain, proved to be a cheap and efficient remedy. The poison is distributed over the area to be planted several days in advance of the planting, the result being that so few of the rodents are left when actual planting begins that practically little damage is done. It is believed that the methods suggested will prove efficacious all over the Rocky Mountain region, and additional experiments will be made in the national forests farther west where the depredating mammals are of different species and may require different methods of treatment.

BOLL-WEEVIL WORK.

Work was continued last year on the boll-weevil problem. The insect has now spread eastward to southwestern Alabama and ultimately no doubt will invade the whole cotton belt. It is planned to send one or more field parties to Alabama and Mississippi during the coming season. Thus far 58 species of birds have been found to eat the boll weevil, and some of them destroy great numbers of the pest daily. By means of our leaflets we are endeavoring to acquaint the farmers of the South with the birds that are most destructive of weevils, and the best way to attract these birds to the cotton fields, as by putting up for their use artificial nests. By the distribution of publications also we endeavor to induce State legislatures to pass laws for the protection of the boll weevil eaters.

INJURIES TO TIMBER BY WOODPECKERS.

Woodpeckers occupy a prominent place among our useful birds because they dig into wood and extract the larvæ of boring insects which no other birds can reach. They thus act peculiarly as con-

servators of the forest. Nevertheless, there are three species, properly known as sapsuckers, which, though eating some insects, damage trees and sometimes kill them by stripping off the outer bark to obtain the cambium or inner bark and the sap.

Here is one of them [indicating]. It is an insignificant-looking bird.

Mr. HAWLEY. What is the name of this bird?

Mr. HENSHAW. It is called the yellowbelly sapsucker. I have here a very interesting specimen, one of many that have been collected during the last year. That [indicating] is a piece of hickory from Maryland. It shows the work of the sapsucker for four years. The first year it pecked those holes [indicating]. Then the wounds healed over, and the next year the bird came back and pecked another row, to extract the sap, and so on.

The CHAIRMAN. Did his work interfere materially with the growth of the tree?

Mr. HENSHAW. They sometimes killed the trees, though that, I think, is comparatively rare.

Mr. STANLEY. Is that what made that ridge there in the bark?

Mr. HENSHAW. Yes, sir. Here I have a finished ax handle which shows, in the finished product, the same kind of staining, which you notice on the specimen of wood. The stains injure the value of the handles for sale, although they sell for a few cents apiece.

Mr. HAWLEY. Does it impair the tensile strength of the wood?

Mr. HENSHAW. It does to some extent, although as a rule not seriously.

Mr. CHAPMAN. Do you say this is hickory?

Mr. HENSHAW. That is hickory; yes, sir.

The inner bark and sap constitute no small part of their food. Moreover, the punctures they make permit entry of moisture, bacteria, and fungi, which cause decay and straining. Unsightly stains lower the market price of the lumber, and the checks are often large and numerous enough to lessen its workability and strength. The loss due to defects in lumber caused by sapsuckers has been conservatively estimated at at least \$1,250,000 annually. Careful investigation has been made of the injuries caused by sapsuckers, especially throughout the South, and a report recommending measures of relief will soon be published.

Mr. HAWLEY. What sapsuckers besides the yellowbelly do this damage that you speak of?

Mr. HENSHAW. What other ones?

Mr. HAWLEY. Yes.

Mr. HENSHAW. There are two others, but the three species are closely allied. That one that I just showed you is the one that does practically the greater part of the damage.

The CHAIRMAN. What is the range of those varieties?

Mr. HENSHAW. The three species range from the Atlantic to the Pacific.

The CHAIRMAN. How far north and south?

Mr. HENSHAW. From near tree limit, south in winter to Central America.

The CHAIRMAN. Do those in the northern latitudes migrate during the winter?

Mr. HENSHAW. Yes; to a very considerable extent.

The CHAIRMAN. I was wondering how otherwise they would be able to subsist if they lived on nothing but sap.

Mr. HINSHAW. They are insectivorous; they do some good by eating insects. But a considerable part of their food is the inner bark and sap of trees.

FOOD OF WILD DUCKS.

Our once abundant waterfowl are fast diminishing in numbers. In the past they furnished an important article of food worth much to every State they breed in or migrate through, to say nothing of their value for sport. If they are to be preserved for future generations, more stringent laws must be passed to protect them. As a further aid the possibility of rearing them in State and private preserves is now being earnestly discussed. The question of food supply has an important bearing on the subject, and during the past year an assistant of the survey has visited several ducking centers, both North and South, for the purpose of obtaining all possible information as to the various plants they habitually use for food. A large number of stomachs also (more than 3,000) have been obtained from sportsmen and others for examination. A report on the subject is in course of preparation.

BIOLOGICAL INVESTIGATIONS.

During the year field work was done in Arizona, Arkansas, California, Illinois, Kentucky, Missouri, Montana, New Mexico, North Dakota, Oregon, Utah, Wyoming, Alaska, and British Columbia. The Biological Survey of Colorado is practically completed and the final report with maps is practically ready for publication. A similar report on New Mexico is almost completed. The Biological Survey of Wyoming has been begun with special reference to its life zones and crop areas and to the economic relations of the mammals and birds. Work was commenced in the Wind River and Bighorn Valleys, the sites of reclamation projects. Inquiries have been received from the Reclamation Service and also from prospective settlers as to the extent within the State of the Upper Sonoran Zone, the zone of corn and apples. A provisional report on the subject was furnished the Reclamation Service.

WOOD RATS.

As the wood rats are widely distributed in the United States, and as they are of considerable economic importance, and moreover one of them has been found infected with plague in California, detailed information as to the number of species and their distribution are likely to be called for at any time. Hence a report on this group has been prepared and published.

A similar report on the ground squirrels is greatly needed, and much of the work of preparation has been done.

SHORE BIRDS.

Now that ducks and geese are becoming comparatively scarce within our territory, the value of our shore birds both for food and sport is increasing. One of them, the Eskimo curlew, has become

extinct within the last 10 years, and others are fast approaching the same fate. A knowledge of the summer and winter abodes of these birds and of their routes of migration are essential to intelligent legislation in their behalf. Accordingly during the year we completed and have recently issued a bulletin on the distribution and migration of these birds.

During the year considerable progress was made in tabulating and mapping the great mass of data already accumulated on the distribution of birds and mammals, so that they may be accessible for ready reference and for utilization in publications.

(The committee thereupon took a recess until 2 o'clock p. m. of the same day.)

AFTER RECESS.

At the expiration of the recess the committee resumed its session, Hon. Charles F. Scott in the chair.

The CHAIRMAN. We will ask you now, if you will, Doctor, to turn your attention to the estimates. I notice there a submitted increase of \$1,500 in the salary of the chief of the bureau. In accordance with the custom of the committee, unless you particularly wish to submit some remarks upon the subject, we will pass it over and take it up with the Secretary when he comes.

Mr. HENSHAW. I might simply say that the last increase in the salary of the chief was made about five years ago.

The CHAIRMAN. Let me inquire when you were made chief of the bureau?

Mr. HENSHAW. Last June.

The CHAIRMAN. June of the present year?

Mr. HENSHAW. Of the present year.

The CHAIRMAN. My understanding is that, while Dr. Merriam, the former chief of the bureau, is giving most of his time to a new employment, he is still retained in an advisory capacity by the department and is available for consultation in the carrying forward of the work.

Mr. HENSHAW. Yes; and he is still doing work which he began under the survey years ago. He has quite a number of unfinished reports to complete.

The CHAIRMAN. What is his present title?

Mr. HENSHAW. "Consulting biologist."

The CHAIRMAN. I mean in the place to which he has gone.

Mr. HENSHAW. The case is this: A large fund has been established by friends of his in New York (chiefly the Harriman family) and the Smithsonian Institution is administering the fund. A yearly income is paid over to Dr. Merriam sufficient for the upkeep of his family and for scientific investigations. He is absolutely free to conduct investigations when and where he pleases and has sufficient funds. He is devoting himself now to scientific work along much the same general scientific lines as when in the bureau, only that now he is unhampered by administrative work.

The CHAIRMAN. Where are his headquarters? Here?

Mr. HENSHAW. Yes, sir; in Washington. He has an office in the National Museum, but he also has a private office in the Northumberland.

The CHAIRMAN. Altogether it appears that of the increase of \$9,700 submitted for your statutory roll \$4,000 covers the transfer of employees from the lump fund, \$4,000 is provided for three new places, and \$1,700 is for promotions. What other promotion is there besides that of the chief?

Mr. HENSHAW. There is a new \$1,600 clerk asked for.

The CHAIRMAN. I find it here now. An increase in salary is submitted in the case of one photographer?

Mr. HENSHAW. From \$1,200 to \$1,400.

The CHAIRMAN. Yes. Have you anything in particular to say as to the reason why that increase should be allowed?

Mr. HENSHAW. He is a man we have employed for a good many years. He is especially skillful in the line of work required in our reports, especially in the photographing of skulls and bones which we use to illustrate our faunas. He has exceptional skill in that direction.

The CHAIRMAN. Do you know how long he has been employed at this salary?

Mr. HENSHAW. I think he was promoted from \$1,000 to \$1,200 about two years ago. I should have to refresh my memory on the exact time; but he has always received a very small salary.

The CHAIRMAN. I presume you have no reason to give for the addition of the three clerks, except the growth of the bureau?

Mr. HENSHAW. The growth of the bureau and the increase of its work; and we need the \$1,600 position as a new grade. There is no place between \$1,400 position and \$1,800; so that promotion would have to be by the sum of \$400.

Mr. HAWLEY. How long have you been associated with the bureau, Doctor?

Mr. HENSHAW. About six years.

The CHAIRMAN. Where did you come from to the bureau?

Mr. HENSHAW. I was previously connected with the Bureau of Ethnology, under Maj. Powell, for about 10 years. Prior to that was connected with the Wheeler expedition and the Smithsonian Institution, doing this same sort of work—this biological survey work. I joined the Biological Survey in 1905.

The CHAIRMAN. What was your salary before you were made chief?

Mr. HENSHAW. \$2,750.

The CHAIRMAN. In the next paragraph, where there is an estimate of \$35,000 "for investigating the food habits of North American birds and mammals," etc., there seems to be an increase of about \$10,000. I notice also that there is some new language introduced in that paragraph, as follows:

And for making experiments in breeding fur-bearing animals and collecting data thereon.

Can you give the committee an idea of just what you want to do under that language?

Mr. HENSHAW. We have done some work already along this line, although we have not made any actual experiments. As the result of field investigations, we have issued a bulletin on the rearing of foxes, and we purpose taking up the rearing of mink more particularly. We think it is perfectly feasible to breed mink in captivity for their fur.

The CHAIRMAN. Has that ever been done anywhere?

Mr. HENSHAW. It has been attempted, and I understand that in a small way it has been successful; but, as far as I know, nobody is doing it successfully at the present time.

The CHAIRMAN. Do you know why the experiments that were undertaken failed?

Mr. HENSHAW. Mainly because they do not understand the feeding and the care of the animals. In most of the experiments that I know of, they have confined a number of the animals in the same inclosure. The consequence is that when the female has young, the male eats them up.

The CHAIRMAN. I take it that a good many fur-bearing animals—the mink among others—have been held in captivity in zoological gardens quite generally?

Mr. HENSHAW. Oh, yes; but under those circumstances they almost never breed.

The CHAIRMAN. Why is it that animals so rarely breed in the zoological gardens?

Mr. HENSHAW. It is very largely owing to confinement and to lack of suitable food; too high feeding. The tendency is to overfeed animals in captivity, and as a result they either do not pair or are infertile.

The CHAIRMAN. So that the experience in the zoological gardens along that line would afford no data that would be of any value to anyone intending to engage in the business commercially?

Mr. HENSHAW. No; I do not think we could get much of value from that source. We have thought of attempting experiments here in our Zoo. Hitherto they have kept mink merely as exhibition animals.

The CHAIRMAN. How much of the increase of \$10,000 which you ask for here do you expect to expend along this line?

Mr. HENSHAW. About \$1,000. We shall probably make a good many field investigations in the rearing of skunks. Skunk fur has latterly become valuable—much more valuable than it used to be. It is worn extensively, especially the fur of the black skunk. The beaver also can be successfully reared in suitable places. So we shall probably experiment along these lines, or at least make field investigations. They have experimented a good deal with foxes in Labrador and Nova Scotia.

The CHAIRMAN. About how much of this \$10,000 increase do you think would probably be needed for that purpose?

Mr. HENSHAW. In experimenting with fur bearers and collecting data we shall expend not to exceed \$1,000.

The CHAIRMAN. And it was chiefly to cover the expense of this new work which you are thinking of undertaking that this increase was made?

Mr. HENSHAW. No. By far the larger part of this sum will be expended in investigating the food habits of birds and mammals.

The CHAIRMAN. Your idea, I presume, is that if your experiments are successful they may point the way to the breeding of fur-bearing animals in a commercial way?

Mr. HENSHAW. Exactly. Not a week passes that we do not get letters on that subject. Some want to go into raising minks; others want to raise skunks. Some want to attempt raising black cats.

Even the fur of that animal is becoming valuable, strange as it may seem.

The CHAIRMAN. There is no particular mystery about the breeding of cats, is there?

Mr. HENSHAW. No; the trouble is to keep them from breeding.

Mr. HAWLEY. Do the conditions of captivity in the zoological gardens affect the nervous system of animals kept there in a way that impairs their breeding functions?

Mr. HENSHAW. They do in the case of a good many animals; not all. The lions in our Zoo are almost always infertile. They mate freely enough, but they rarely have young. Confinement and food are the two things at fault.

Mr. HAWLEY. The principal difficulty in breeding skunks is with the scent, is it not?

Mr. HENSHAW. No; there is no trouble at all about that. If the skunk is not molested, he never molests anybody.

Mr. HOWELL. They will get into the chicken coops once in a while.

Mr. HENSHAW. Well, yes; I will say that you have to look out for raids on the chicken coops. But I mean so far as the odor is concerned.

Mr. HAWLEY. When they are raised in captivity commercially, can they be slaughtered so as to keep their pelts free from the odor?

Mr. HENSHAW. Naturally they are loath to use their peculiar defensive weapon.

Mr. HAWLEY. I have never noticed it, but I will take your word for it.

Mr. HENSHAW. It is a fact.

The CHAIRMAN. Could a surgical operation be performed which would not be permanently injurious to the animal and yet would make it incapable of using this weapon?

Mr. HENSHAW. Oh, yes. It has been done many times; it is not a very difficult operation, but the mortality is large.

The CHAIRMAN. Just what is the organism through which this offensive odor is produced?

Mr. HENSHAW. There are two scent bags close to the backbone. These open into the excretory canal just behind the anus. They are compressed by very powerful sphincter muscles; the animal everts the anus, and two little nipples project out. You can see them distinctly if you are curious enough to take the trouble.

The CHAIRMAN. I never got close enough.

Mr. HENSHAW. Then the fluid which is secreted in these glands is shot out. It will go about 15 feet. It is amber colored, and it can be seen distinctly. But they never use this weapon if they can avoid it. So the animals are safe enough if unmolested.

Mr. HAWLEY. How do they kill them—by chloroforming them before slaughtering them?

Mr. HENSHAW. That is one way; but if you can get near enough to hit them on the backbone, that paralyzes the muscles, and they can not eject the fluid.

Mr. HAWLEY. Just about the hips?

Mr. HENSHAW. Just about the hips—the small of the back.

Mr. HOWELL. Will they allow any one to get that close without first emptying their vials of perfume on him?

Mr. HENSHAW. If you approach a skunk cautiously he will not trouble you.

Mr. HAWLEY. If you should find one wild in the woods and should shoot him through the top of the hips, would that paralyze the muscles?

Mr. HENSHAW. Yes; if the shot strike the backbone the animal is paralyzed.

The CHAIRMAN. There appears to be no increase recommended in your paragraph for biological investigation, and only a small amount for your general administrative expenses. Do you know whether the reduction in your administrative paragraph is due entirely to a transfer from a lump fund or is there an actual increase there?

Mr. HENSHAW. I think there is an actual increase; \$3,900 is the actual increase.

Mr. HAWLEY. It says in the note that there is an actual increase of \$33,480.

The CHAIRMAN. That is the entire increase, in all the paragraphs. We overlooked the paragraph on page 65, where I notice that there seems to be an increase in the first paragraph of about \$4,000.

Mr. HENSHAW. Yes. That is to provide a \$1,600 clerk and two \$1,200 clerks. The \$1,200 clerks are for service in the division of food habits of birds and mammals and in the biological investigations division. All the clerical work they require is done from our central office, and we are pushed to the limit to do all that is needed. The force is too small.

The CHAIRMAN. Those clerks, I presume, appear in the statutory roll?

Mr. HENSHAW. Yes, sir.

The CHAIRMAN. But I was referring to the first paragraph, under the head of "General expenses," for the enforcement of two or three acts of Congress, where there appears to be an increase. Do you happen to know how much of that is due to the transfer of clerks from lump funds?

Mr. HENSHAW. I do not know. Perhaps Mr. Zappone can tell you.

Mr. ZAPPONE. That is for game preservation, is it not?

The CHAIRMAN. Yes.

Mr. ZAPPONE. The amount is \$1,000. You will see a note just above, Mr. Scott.

Mr. HENSHAW. Oh, yes.

Mr. HOWELL. Does your bureau ever investigate diseases of birds or animals?

Mr. HENSHAW. We cooperate in that field with the Bureau of Animal Industry.

Mr. HOWELL. In the State of Utah during the last fall there were thousands of ducks that died from a peculiar disease which our local people were unable to diagnose. It was stated that there were thousands of them that died along the shores of the Great Salt Lake from some disease. Has that matter ever been called to your attention?

Mr. HENSHAW. Yes, sir. We obtained some of the ducks. They were shipped to us not long ago, and we turned them over to the experts of the Bureau of Animal Industry for report as to the cause of the disease. We shall probably get a report soon upon that subject. It is quite important, because there are many thousands of those ducks that have died, and apparently from no known cause.

Mr. HOWELL. Not only that, but it destroyed the usefulness of the rest. We became suspicious that the disease had entered all the ducks and made them useless as food products. There are millions of them on the lake; but the disease excited the suspicions of the people so that they would not use them.

The CHAIRMAN. I notice that you ask an increase of nearly \$5,000 under the game-preservation paragraph. What are the conditions which make that increase necessary?

Mr. HENSHAW. That will be used very largely for the enforcement of the Lacey Act, which we never have been able to strictly enforce through lack of adequate appropriations and also because of a defect in the law which has now been corrected. Formerly when a seizure of game was made under the Lacey Act, we had to prove that it was killed in violation of law. We were rarely able to do that in the case of game shipped during the open season. It practically nullified the law. Now it is only necessary to show that the game is either killed or shipped illegally, or that the packages containing it are improperly marked.

The CHAIRMAN. Do not all the States now enforce their game laws pretty rigidly, so that there is really not much left for the Federal Government to do in the way of interstate commerce?

Mr. HENSHAW. I think there is a very large amount of work to do in the enforcement of the Lacey Act. We have really just begun that work. If we undertake to carry it through much larger appropriations will be necessary in the future. The law is being violated quite largely in some game centers, and our efforts hitherto have been concentrated chiefly in St. Louis and Chicago. These cities were formerly great markets for the receipt of illicit shipments of game.

The CHAIRMAN. You ask for an increase of \$8,000 for the maintenance of mammal and bird reservations. Your appropriation for that purpose this year is only \$7,000. What are the conditions which make it necessary to have more than twice as much?

Mr. HENSHAW. In the past a great deal of that work has been done by Audubon societies. They are manifesting unwillingness to carry so large a part of the burden. You see, we have 50 reservations, and up to date we have provided for the patrolling of just about half—25.

Mr. HAWLEY. How much did the Audubon societies expend last year and preceding years?

Mr. HENSHAW. That I can not say. It is a large amount.

Mr. HAWLEY. About as much as the Government expended?

Mr. HENSHAW. Much more.

Mr. HAWLEY. They will still continue to expend considerable sums, will they not?

Mr. HENSHAW. Yes; they are willing to cooperate with us, but they ask us to assume all of the burden that we possibly can, because their funds are running low, owing to the large demands on them.

Mr. LEVER. How many men do you have on each of these reservations, Doctor?

Mr. HENSHAW. I do not recall any where we have more than one, except in the case of the Breton Reservation and the three reservations on the coast of Washington. Because of their isolation each warden on these reservations has an assistant.

Mr. LEVER. What is his salary?

Mr. HENSHAW. I think the largest salary we pay is \$25 a month. You see it is not necessary to patrol the reservations, or most of them, except during the breeding season.

Mr. LEVER. What are the duties of these men? What do they do?

Mr. HENSHAW. Some of these reservations are the resorts of plumage birds, like herons. Some of them are the resorts of game birds, like ducks and curlews and geese; and they have to be patrolled, either during the breeding season or the hunting season.

The CHAIRMAN. Has the patrol authority to arrest?

Mr. HENSHAW. He has under certain circumstances, particularly if he finds a person in the act of violating the law. One or two of the wardens hold commissions as deputy United States marshals; others have been appointed deputy State game wardens because it is frequently necessary to act under the State laws, and in this way they can cooperate better with local authorities. A great many of our bird reservations, some of the more important ones, still remain unsurveyed, and we can not draw the line of demarcation between the Government and the State lands. There it is simply a question of warning off people or if possible proceeding under the State law. That is to say, the wardens (who generally are State game wardens) have to proceed under State law; they can not proceed under the Federal law.

The CHAIRMAN. Do the States contribute any portion of the expense of maintenance of these patrols?

Mr. HENSHAW. Yes; in a few cases in which the wardens cooperate in enforcing State laws in the region contiguous to the reservations. They also allow their wardens to act with us, so as to insure the safety of the birds breeding on these reserves.

Mr. HAWLEY. Do the States have any control at all over the bird reserves—over the game in them?

Mr. HENSHAW. Much the same as they would have over reservations established by private individuals. That is to say, the creation of bird reserves merely prevents trespass of a certain sort, namely, killing the birds. The Federal Government simply exercises the same right to prevent trespass on its lands that any landowner does on his own property.

The CHAIRMAN. By virtue of what act does the Federal Government go within the limits of a State and establish authority over a reservation for the protection of birds and mammals?

Mr. HENSHAW. It does not do so except on its own lands. The Government reservations are set apart by Executive order. These that we speak of are not State reservations but Federal reservations.

The CHAIRMAN. It was all Federal property in the beginning?

Mr. HENSHAW. Yes, sir.

Mr. HAWLEY. Have the States released police jurisdiction over the reservations?

Mr. HENSHAW. No; and there seems to be no immediate necessity for their so doing.

Mr. HAWLEY. But in all those cases, unless the State releases the jurisdiction, it runs in my mind that the State still retains police jurisdiction.

Mr. HENSHAW. That is the case unless the State formally releases jurisdiction.

Mr. HAWLEY. Is it not generally the rule that the States have control of animals that are *feræ naturæ* within their boundaries?

Mr. HENSHAW. Within their boundaries, yes; but of course they are very glad to have the Federal reserves there, because that largely increases the output of game. More or less of our game escapes from the Federal reservations, but that is all right; it is the State's property then, and can be taken under any regulations which the States may see fit to make.

Mr. HAWLEY. You think the States could not take the game on the Federal reserves; do you?

Mr. HENSHAW. I do not think so; no.

Mr. HAWLEY. I hope not; but my attention has never been called to an act by which any State (especially Oregon, for instance, with which I am somewhat familiar) has released its police jurisdiction, or its right of control of animals that were of a wild nature. It may have been so done, but I do not recall it.

The CHAIRMAN. As a matter of fact, the force which you exert in most of these reservations is chiefly moral, is it not?

Mr. HENSHAW. Most emphatically. Moreover, we charge our wardens everywhere to avoid any possible conflict with State law, and as far as they can with citizens.

The CHAIRMAN. I suppose in nine cases out of ten mere notice to a trespasser by a Federal official that this is a Federal game preserve would be sufficient?

Mr. HENSHAW. It is quite enough in nearly all cases.

Mr. HAWLEY. Have you arrested any trespassers for killing game on a Federal reserve?

Mr. HENSHAW. Yes; in several instances.

Mr. HOWELL. I presume the game laws in the States where you have these reserves are substantially in accord with yours?

Mr. HENSHAW. Yes; exactly so. I was just going to say that the State wardens, however, can and do enforce their laws.

Mr. HAWLEY. But they have to do that by virtue of State law?

Mr. HENSHAW. By virtue of State law.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 15, 1910.

AFTERNOON SESSION (CONTINUED).

**STATEMENT OF MR. A. ZAPPONE, CHIEF OF THE DIVISION OF
ACCOUNTS AND DISBURSEMENTS, DEPARTMENT OF AGRICULTURE.**

The CHAIRMAN. I will ask you, Mr. Zappone, to take up the estimates as they appear here, and, without waiting to be questioned, to call our attention to whatever increases there are, and then let us have your reasons for recommending the increases.

Mr. ZAPPONE. Mr. Chairman, before doing that I think it might interest the committee to let me read a brief statement, which I have prepared upon your suggestion, covering in a general way the work of this division.

The Division of Accounts and Disbursements audits, adjusts, and pays all accounts and claims against the department; prepares advertisements for all work and supplies not contracted for by the general supply committee of the executive departments; prepares letters of authority; writes, for the signature of the Secretary, all letters to the Treasury Department pertaining to fiscal matters; examines and signs requisitions for the purchase of supplies; issues bills of lading and requests for passenger and freight transportation; prepares the annual estimates of appropriations; prepares annual fiscal reports to Congress, and transacts all other business relating to the financial interests of the department.

From year to year the work of the division has steadily increased, not only in volume on account of larger appropriations to be disbursed, but also in complexity on account of the increased number of appropriations and subappropriations. For example, the total agricultural appropriations for the fiscal year 1902 were \$4,772,780.51, distributed under approximately 50 appropriations and subappropriations, while the appropriations for the current fiscal year, 1911, aggregate \$17,697,636, distributed under more than 275 appropriations and subappropriations. This is an increase, within a decade, of about 270 per cent in the total amount of the appropriations and 450 per cent in the number thereof. The division of general appropriations into subappropriations materially complicates the work of the Division of Accounts and Disbursements, the keeping of a separate account being necessary under each subappropriation, but is of value not only in that it enables this committee to comprehend more fully the needs of the department and thus provides therefor in the most economical manner, but also in that it enables the committee

on expenditures to check up the department more closely as to the manner in which its appropriations have been expended.

Some idea of the volume of routine business transacted by the Division of Accounts and Disbursements may be gained from the following figures which have been compiled for the fiscal year ending June 30, 1910, the last fiscal year for which complete data are available:

There were received, audited, and paid \$105,000 accounts, in addition to which 2,529 accounts were sent to the Treasury for direct settlement. There were also paid by the department supplemental accounts for the fiscal year 1909, aggregating \$1,681,081.69. In connection with the payments of accounts by the department, 294 requisitions were drawn on the Treasury for advances of funds, and 196,684 checks were drawn and sent out to payees.

Twenty-five thousand four hundred and eighty-three orders for the purchase of supplies were prepared and sent to dealers, while in the transaction of the ordinary fiscal business of the department 134,012 letters were written and received.

Forty-one thousand eight hundred and twenty-eight requests for passenger transportation were issued during the year, and 8,807 requests on the Quartermaster General for transportation of Government property and on this office for departmental bills of lading.

During the fiscal year 1910 the following important change was made in the manner of conducting the fiscal affairs of the Forest Service:

By the terms of General Order No. 138, dated January 15, 1910, the Secretary of Agriculture placed the disbursing and accounting work of the Forest Service under the immediate supervision and direction of the Chief of the Division of Accounts and Disbursements, who was also given authority to make, subject to the approval of the Secretary, such changes in the methods of accounting and disbursing in the Forest Service as might be deemed necessary from time to time. By the same order the fiscal agents of the Forest Service, both in Washington and at the district centers in Missoula, Mont.; Denver, Colo.; Albuquerque, N. Mex.; Ogden, Utah; San Francisco, Cal.; Portland, Oreg., and Madison, Wis., were made subject to the instructions of the Chief of the Division of Accounts in all matters pertaining to accounts and disbursements. The agricultural appropriation act of May 26, 1910 (for the fiscal year ending June 30, 1911), supplemented the Secretary's action by transferring these fiscal agents from the Forest Service to the statutory roll of the Division of Accounts and Disbursements, thus completing the change which places the Forest Service on an equal footing with other bureaus in regard to fiscal matters, and brings its accounting and disbursing work under the immediate supervision and direction of the Chief of the Division of Accounts and Disbursements, who is by statute the administrative officer of the fiscal affairs of the Department of Agriculture.

The total amount carried by the agricultural appropriation act for the current fiscal year (1911) is \$13,487,636 (not including the permanent appropriation of \$3,000,000)—a net increase of \$492,600 over the amount carried by the corresponding act for the fiscal year ending June 30, 1910, said increase being made up as follows. (I am comparing the appropriation for the current year 1911 with the preceding

year 1910, so that you may know the changes in the bill of the current year.)

Weather Bureau: An increase of \$15,000 for the reconstruction of the observatory building at Sand Key, Fla., \$500 additional for telegraphic tolls, \$500 additional for station salaries, and \$500 additional for rents outside of Washington; a total increase of \$16,500.

Bureau of Plant Industry: Increases of \$25,000 for cotton standardization work, and \$35,000 for cotton-boll weevil investigations; a total increase of \$60,000.

Forest Service: An increase of \$397,500 to cover the care and administration of 26,528,439 acres added to the national forests during the fiscal year 1910, and an increase of \$4,000 for paper test work; a total increase of \$401,500.

Bureau of Chemistry: An increase of \$25,000 for the pay of witnesses in connection with the enforcement of the food and drugs act.

Bureau of Entomology: An increase of \$5,000 for white-fly investigations.

Bureau of Animal Industry: The 1910 act provided \$25,000 for the purchase of land at Beltsville, Md., for a bureau experiment station; the 1911 act provided \$12,000 for the equipment of this station; a net decrease of \$13,000.

Division of Publications: A decrease of \$2,400 under the head of labor-saving machinery.

The increases shown above under Weather Bureau, Bureau of Plant Industry, Forest Service, Bureau of Chemistry, and Bureau of Entomology aggregate \$508,000; the decreases shown under Bureau of Animal Industry and the Division of Publications aggregate \$15,400. The net increase for the fiscal year 1911 is, therefore, \$492,600, as stated.

In the 1911 act a number of places were transferred from the lump fund to the statutory rolls of the several bureaus, and a number were transferred from the various bureaus to the office of the Secretary, but the grand total carried by the act was not affected thereby.

At the request of the chairman of this committee I desire to submit a brief statement regarding certain fiscal and other reports which the department is at present required by law to submit annually to Congress, but which it is believed might, in the interest of economy, be dispensed with without detriment to either Congress or the department.

(1) THE SO-CALLED "THREE-YEAR REPORT."

The provisions of law under which this report is submitted read as follows:

That hereafter on or before the first day of January of each year the Secretary of Agriculture shall submit to Congress, in addition to the estimates now required by law, classified and detailed estimates of every subject of expenditure intended for the Agricultural Department for the next fiscal year, and detailed reports of all expenditures under any appropriation for such service during the preceding fiscal year. (34 Stat. L., 1282.)

Provided, That hereafter on or before the first day of January of each year the Secretary of Agriculture shall submit to Congress classified and detailed reports of all receipts by the Forest Service and classified and detailed estimates of all expenditures intended for this service for the next fiscal year and detailed reports of all expenditures under any appropriation for such service during the preceding fiscal year. (34 Stat. L., 1270.)

That is included in the three-year report, but was included in the appropriation bill as a separate provision.

In the preparation of the report required by the foregoing statutes, it has been the custom of the department to arrange the required matter in parallel columns and to include an intermediate column setting forth the appropriations of the fiscal year current at the time

of the rendition of the report. The intermediate column forms a connecting link between the expenditures of the preceding fiscal year (shown in the left-hand column) and the estimates for the succeeding fiscal year (shown in the right-hand column), and without it comparisons between expenditures and estimates would be well-nigh if not altogether impossible. The expenditures recorded in the left-hand column are fully covered in the annual report of expenditures; the estimates appearing in the right-hand column will be found in detail in the Book of Estimates. It is apparent, therefore, that the "three-year report" is a duplication of matter to be found elsewhere, and hence could be dispensed with without detriment to the public interest. As the cost of preparation of this report is \$3,455 and the cost of printing it is \$2,865.49, its discontinuance would result in an annual saving of \$6,320.49.

(2) THE "TRAVEL REPORT."

The provision of law under which this report is submitted reads as follows:

It shall be the duty of the head of each executive department and other Government establishment at Washington to submit to Congress at the beginning of each regular session a statement showing in detail what officers or employees (other than special agents, inspectors, or employees who in the discharge of their regular duties are required to constantly travel) of such executive department or other Government establishment have traveled on official business from Washington to points outside of the District of Columbia during the preceding fiscal year, giving in each case the full title of the official or employee, the destination or destinations of such travel, the business or work on account of which the same was made, and the total expense to the United States charged in each case. (35 Stat. L., 244.)

As will be seen from the foregoing citation, the travel report covers travel only from Washington to points outside of the District of Columbia, a comparatively small portion of the travel of the entire department. On the other hand, in the annual report of expenditures, required by Twenty-third Statutes at Large, page 356, the department reports the total travel and station and field expenses of every employee, both in and out of Washington. It is true that the information in the travel report is more detailed in character than that contained in the report of expenditures, but as information to supplement that of the report of expenditures is available at all times for congressional committees or individual Congressmen applying therefor it would seem to be in the interest of economy for Congress to exempt the Department of Agriculture from the operation of the statute requiring the rendition of the travel report. As the cost of preparation of this report is \$1,340 and the cost of printing it is \$987.56, its discontinuance would result in an annual saving of \$2,327.56.

In addition to the three-year report and the travel report, both of which are prepared in the Division of Accounts and Disbursements, the following reports, prepared elsewhere in the department, might, in my opinion, be dispensed with without prejudice to the public interest. It should be noted in passing that they are required exclusively from the Department of Agriculture.

(3) "APPOINTMENTS AND PROMOTIONS IN THE DEPARTMENT ON LUMP-FUND ROLLS."

This report, the nature of which is indicated by its title, is rendered annually under the requirements of 34 Statutes at Large, 1280. It is estimated that the cost of preparation of this report is \$2,400 and that the cost of printing it is \$6,890. With the discontinuance of this report, therefore, an annual saving of \$9,290 would be effected.

(4) "OPERATIONS OF THE BUREAU OF ANIMAL INDUSTRY."

This report is required by 23 Statutes at Large, 33. Much of the subject-matter in this report is presented in other publications of the department, for which reason it is believed that this report should be discontinued. A saving of \$1,350 annually would be effected thereby, as it is estimated that the cost of preparation is at least \$350 and the cost of printing \$1,000.

(5) "REPORT SHOWING SALARIES AND EXPENSES OF MEAT INSPECTORS."

This report is required by 34 Statutes at Large, 1265, and so far as I know is used by neither the department nor any of the Congressional committees. The cost of preparation of this report is \$350 and the cost of printing it is \$950. Its discontinuance would therefore effect an annual saving of \$1,300.

(6) "ANNUAL STATEMENT OF PUBLICATIONS RECEIVED AND DISTRIBUTED."

This report is required by 28 Statutes at Large, 623. It costs about \$100 to prepare this report and \$183 to print it, and as, apparently, no good purpose is subserved thereby it is thought that the report may be discontinued without prejudice and an annual saving of \$283 be effected.

(7) "DETAILED STATEMENT OF SUMS USED FOR COMPENSATION AND EXPENSES OF ANY OTHER PERSON EMPLOYED BY ANY STATE, COUNTY, OR MUNICIPAL GOVERNMENT."

This report is required by 35 Statutes at Large, 261, and relates exclusively to the Bureau of Chemistry of the department. It is a very small report costing only about \$10 to prepare and print, and is of such doubtful value that its discontinuance is recommended.

In the foregoing matter I have referred to seven reports which, in my opinion, might be discontinued without detriment to Congress, the department, or the public at large. Such action, if taken by Congress, would result in a total saving of \$20,881.05 annually.

For the information of the committee I desire to make the following brief statement regarding the expenditures of the department for the fiscal year 1910, classified as required by the committee on expenditures. This matter will appear in similar form in our annual report of expenditures now in press.

Expenditures, Department of Agriculture, fiscal year 1910.

Statutory salaries.....	\$1,308,686.95
Lump-fund salaries in Washington.....	1,471,730.63
Lump-fund salaries outside of Washington.....	7,906,856.70
Stationery.....	105,591.10
Miscellaneous supplies and services, equipment, books, machinery, etc.	1,947,549.27
Furniture.....	80,407.37
Fuel.....	30,165.02
Freight.....	33,401.75
Express.....	14,004.99
Telegraph.....	190,375.76
Telephone.....	42,513.85
Rent.....	268,028.18
Gas and electricity.....	25,096.65
Apparatus, instruments, and laboratory material.....	129,347.64
Printing and binding.....	3,095.54
Travel and station and field expenses.....	1,152,495.53
Total.....	14,709,346.93
Total appropriations for Department of Agriculture.....	15,896,845.27
Total expenditures under above groups.....	\$14,709,346.93
Advances to temporary special disbursing agents of the Forest Service.....	70,712.00
Forest Service refunds:	
To depositors, excess deposits.....	48,966.86
Payments to Uinta Indians.....	1,113.47
Payments to States and Territories, 25 per cent of receipts.....	438,702.81
Total expenditures of entire Department of Agriculture.....	15,268,842.07
Unexpended balance on Aug. 31, 1910.....	628,003.20
Repayments to credit of appropriations.....	40,756.94
Net unexpended balance on Aug. 31, 1910.....	668,760.14
Of this amount there was available for further disbursement.....	692.80
Balance.....	668,067.34
Outstanding liabilities (estimated).....	312,051.81
Balance to be turned back in Treasury (estimated).....	356,015.53

The CHAIRMAN. Now, let us take up the estimates in the order in which they appear. You may make such comment as you desire on any changes or increases that appear. In connection with the first paragraph, where I notice an increase of \$750 is submitted for the salary of the chief of the division and disbursing clerk, I should like to know how the present salary of \$3,250 compares with the salaries of similar officers in other departments.

Mr. ZAPPONE. In the Department of Agriculture all of the accounting and disbursing work is centralized in one office, while elsewhere in the executive departments it is usually broken up and distributed among several offices. It is therefore very difficult to make a comparison except by assembling and including the several offices when referring to the other departments. I have a brief statement here regarding the salaries of disbursing officers which, with the permission of the committee, I will read. I would rather not say anything about the promotion under discussion if you will kindly excuse me.

The CHAIRMAN. We should be glad to have you read that.

Mr. ZAPPONE. I will simply read this statement, as I prefer to leave the rest to the committee:

DISBURSING OFFICERS.

Department of Justice: Disbursing clerk, \$2,750; Chief of Division of Accounts, \$2,500.

Department of the Interior: Chief disbursing clerk, \$2,250 (office of Secretary); depositary, acting for the commissioner as receiver of public moneys, \$2,000 (General Land Office); financial clerk, \$2,250 (Indian Office); financial clerk, \$2,250 (Patent Office); compensation to disbursing clerk, \$1,000 (office of Superintendent of Capitol Buildings and Grounds); disbursing clerk, \$2,500 (Geological Survey).

Treasury Department: Disbursing clerk, \$3,000, deputy disbursing clerk, \$2,750, office of disbursing clerks; Chief of Accounts Division, \$2,500 (office of Supervising Architect); disbursing agent, \$2,400 (Bureau of Engraving and Printing).

Post Office Department: Disbursing clerk, \$2,250 (salaries Post Office Department); Superintendent Division of Finance, \$2,250 (office Third Assistant Postmaster General).

Panama Canal Commission: It is understood that the disbursing clerk for the Panama Canal Commission receives \$5,000 per annum.

Mr. LEVER. These other places combined would be similar to the place filled by the Chief of the Division of Accounts and Disbursements?

Mr. ZAPPONE. They would be similar to the place filled by the Chief of the Division of Accounts and Disbursements.

Mr. LEVER. And in the Department of Agriculture they are concentrated in the one office?

Mr. ZAPPONE. They are all concentrated in the one office.

Mr. HAWLEY. How long has the salary been \$3,250?

Mr. ZAPPONE. About two years.

The next position is that of the Assistant Chief of the Division. A promotion of \$250 is recommended in his case.

The CHAIRMAN. How long has he been at the present salary, \$2,500?

Mr. ZAPPONE. Five years. He has been in the Government service for nearly 21 years. He has charge of the accounts and disbursements at the Weather Bureau, under my supervision, and relieves me at the department when it is necessary for me to be absent temporarily from my office; he also assists me in many other ways in my division at the department. As previously stated, the work of my division has increased about 270 per cent during the past 10 years, and I am compelled to call upon the assistant chief of the division to assist me on the many important matters that are constantly arising. He has to assist me in addition to looking after his multifarious duties at the Weather Bureau, and it is believed that this small increase should be allowed. In fact, I think the increase should be \$500 instead of \$250, and I so recommended to the Secretary, but in view of his desire to keep down expenses he deemed it wise to submit an increase of only \$250. I am free to say that I know of no one in the department who is more efficient, capable, and deserving of promotion.

The CHAIRMAN. Eliminating the personal element, would you say that a salary of \$2,500 is not high enough for such a position?

Mr. ZAPPONE. I should certainly say that it is not high enough. If you take into consideration the salaries of the assistant chiefs of the other bureaus and independent divisions, not only of the Department of Agriculture but of other departments as well, I feel that you will agree with me. Mr. Calvert also supervises, under the chief of the Weather Bureau, the construction of any Weather Bureau buildings that may be authorized by Congress. He is a most capable man, exceedingly efficient in every line of work that he takes up and very deserving of this advancement.

The next place is that of supervising auditor. The present incumbent has been in the Government service for 28 years; it has been 8 years since he has had a promotion. He is one of the most capable auditors in the Government service. In fact, I know of no auditor in the Government service, not excepting the Treasury Department, that is his superior in any way. It is largely due to his efforts that the standard of the accounts of the Department of Agriculture (if I do say it) is exceedingly high.

I should like to say, in connection with the supervising auditor, that there are really no places elsewhere in the Government service comparable to his except those of the auditors and the deputy auditors of the Treasury Department, who receive \$4,000 each, and \$2,500 each, respectively.

Passing to the chief clerk and cashier. He has been in the Government service seven years, and has occupied his present position for more than a year. It has been about two years since he was promoted in salary. He also is a very capable man and under bond.

Mr. McLAUGHLIN. Was he promoted from one position to another, or promoted by increase of salary?

Mr. ZAPPONE. He was promoted from auditor to cashier without change of salary. The cashier that I had before the present incumbent I sent over to the Forest Service to take charge of the branch there. Mr. Smith, my present cashier, was then transferred from the position of auditor at \$2,000 into this position, which, you might say, really involved a loss of salary, because as cashier he had to give a bond and pay for it out of his salary, which was not increased.

The CHAIRMAN. You will remember that in fixing these salaries we have to consider the fact that we are determining the salary of the position, and not passing upon the merits of the individual who at the time may happen to hold it. We realize that when one man remains in a position a long time he becomes especially expert, and on that account might perhaps be entitled to a higher salary. But we must look to the time when he will be either promoted or will vacate the office for some reason or other, when a new man without his special training has to be put in. The question would then arise whether the salary was not really higher than it should be. So we should like to have your advice too as to the salary which any man ought to get who could capably fill this place.

Mr. ZAPPONE. I am of the opinion that the position should pay at least \$2,250. The responsibility is very great; and you, gentlemen, are aware of the amount of the appropriations at the present time. I might add that he personally handles about \$100,000 in cash at one time each regular pay day, of which there are 24 in the year.

The CHAIRMAN. Do you know how much he has to pay for his bond?

Mr. ZAPPONE. I should say about \$20. It is not a very large amount, sir.

The CHAIRMAN. What do you have to pay for your bond?

Mr. ZAPPONE. I pay \$75.

The CHAIRMAN. You are bonded in what sum?

Mr. ZAPPONE. \$50,000.

The CHAIRMAN. And this man?

Mr. ZAPPONE. This man is bonded in the sum of \$10,000; but the rate on a small bond is higher, proportionately, than on a large bond.

Then, too, my bond has been running for some little time. I got it when rates were lower than they are to-day. You will probably recall that the bonding companies have made a determined effort to raise the price of bonds, and have succeeded to some extent, although they have not yet won out entirely. In another year or two I, and also my cashier, may have to pay a much higher premium.

The CHAIRMAN. In the next item, it appears that you have either eliminated one district fiscal agent, or created a new position. Which is it?

Mr. ZAPPONE. I have simply changed the designation from "fiscal agent" to "deputy disbursing clerk," without change of salary.

At the end of the matter relating to the accounts division is a new provision similar to one incorporated in the 1911 legislative act in connection with the disbursing office of the Treasury Department. By this provision the deputy disbursing clerk is authorized to sign checks in the name of the disbursing clerk in cases of emergency, and when the latter is absent from his office.

I should like very much to see this addition to our present law. You gentlemen, I know, realize that the department has grown very rapidly during recent years. As already stated, the number of checks issued each year is over 100,000—a great many for one man to sign. There is also such a thing as a person becoming sick, or having to take a little leave, although people occupying positions like mine do not get very much leave.

The CHAIRMAN. Under the law as it stands now, are you personally required to sign every check?

Mr. ZAPPONE. I am personally required to sign every check issuing from our department in the city of Washington. We have some fiscal agents in the field, of course; but I sign everything in Washington.

The CHAIRMAN. You personally sign every check?

Mr. ZAPPONE. Every check, including those for the salaries of all the field employees—over 100,000 checks a year.

Mr. LAMB. They are making this provision in other departments, too. The Treasury Department asked for it before my Committee on Expenditures in the Treasury Department.

Mr. ZAPPONE. This is a provision similar to that for the disbursing clerk of the Treasury Department. I am not complaining at all, gentlemen; but when you are signing from 1,000 to 2,000 checks a day, around the first of the month, this duty becomes rather arduous.

The CHAIRMAN. I should think the chief argument for the change would be that you ought to be able to put in your time in doing a little more valuable work than merely signing your name.

Mr. LAMB. That is the argument that was made before the Committee on Expenditures in the Treasury Department.

Mr. ZAPPONE. That is true, Mr. Chairman; and when my duties necessitate my being away from my office (as I have been during the past week or two), I have to go home and work at night to catch up on routine business, including the signature of all checks which have been prepared during the day.

The CHAIRMAN. In that connection, will you give the committee an idea of how much overtime you ordinarily give to your work?

Mr. ZAPPONE. My modesty hardly permits me to answer that. I have never kept any account, Mr. Chairman, but I work a great

deal overtime. In fact, there is hardly a night I do not work, if I am at home. Once in a while I do take a night off, at the request of my wife. But otherwise the business of the department, particularly during the winter season, requires my personal attention not only during the day, but also during a portion of each evening, either at home or at my office.

The CHAIRMAN. What are your usual hours at the office?

Mr. ZAPPONE. From 9 a. m. to 5.30 p. m. I never leave the office before half past 5, and often I have anywhere from two to six men engaged at work there at night with me. I have arranged to have four there to-night; and when I leave here I will go there, and work until 10 o'clock on some special official business.

The CHAIRMAN. There is no provision for extra pay for overtime?

Mr. ZAPPONE. None whatever for employees on the statutory roll. Our work, of course, is just like that of a banking house; we have to balance our accounts every day. The financial reports and many other fiscal matters must be kept up all the time. While Congress is in session we have a good many special reports to make, too—a good many compilations that are called for by the Secretary, and which simply can not be done during the day without interrupting the current routine work and allowing it to run behind. The committee on expenditures went into this matter quite thoroughly last winter, and it is understood that they will shortly make some recommendation to Congress regarding the discontinuance of some of these reports.

The CHAIRMAN. Do you usually take your annual leave?

Mr. ZAPPONE. I do not think I have had any leave in seven years. I might add that although I have been in the Government service for 30 years, I have never been sick except for a day or two at a time, and even then I went to the office and performed my work. I have always managed to get down to the office in some way, although that is not a record that I am trying for. When I am sick I would rather be at work.

Mr. LAMB. I can duplicate that.

Mr. ZAPPONE. But we are quite accustomed to working overtime in our office. We do not mind it; and I must say that my subordinates have always responded cheerfully.

I hope my request for additional clerks will be allowed, if you can consistently grant the increase, which is predicated largely upon the increases that you gentlemen will probably make in the various appropriations for the department. If you do not make many large increases in the appropriations, I can get along with fewer new places. Instead of six, as indicated, I believe I can get along with four. If the estimates go through about as they have been submitted, however, I shall need all of the force included in the estimates for the Accounts Division.

There is one other suggested promotion here that I do not believe I have yet discussed—that of the supervising bookkeeper. He has been in the Government service for 10 years, and it has been two years since he has had a promotion. He is also a very efficient man, and one of the willing workers—one of the men always ready to work overtime.

The CHAIRMAN. Has he been acting as a supervising bookkeeper?

Mr. ZAPPONE. He has been acting as a supervising bookkeeper, but his salary is now \$1,800. He is a clerk of class 4. I am acquainted

with the feeling of committees of Congress generally that they do not want clerks to go higher than \$1,800; so I thought I would call him by a title which fits his work. He is the supervising bookkeeper of the department, and has 8 or 10 clerks under him connected with that work, in addition to which he is charged with the indexing of the annual report of expenditures of the department. It requires from 30,000 to 40,000 cards a year to index that report and classify it as it is now classified. In giving you the expenditures of the department a few minutes ago, I read the recapitulation from that report.

The CHAIRMAN. And he keeps up those cards, does he?

Mr. ZAPPONE. He keeps up those cards in addition to looking after the general bookkeeping of the department. He will also supervise the books that are kept for the liabilities and the expenditures in the several bureaus of the department. I make periodical inspections of these books, so as to have a uniform system throughout the department, and the supervising bookkeeper will accompany me.

The CHAIRMAN. Just what does he do as supervising bookkeeper? Does he do anything more than inspect the books occasionally to see that they are being kept according to the prescribed method?

Mr. ZAPPONE. That is all, so far as the other bureaus are concerned. You could cut out the term "supervising" if you wish. I thought it would perhaps assist in getting the place through on the floor of the House; and it is an expression that is used in some of the other departments. In the Treasury Department these men are called "principal bookkeepers." The Treasury Department has a bookkeeper at \$1,900 in the office of the chief clerk; two principal bookkeepers, at \$2,100 each, and 12 bookkeepers, at \$2,000 each, in the division of bookkeeping and warrants; one bookkeeper, at \$2,100, in the division of loans and currency; one principal bookkeeper, at \$2,500, and one assistant bookkeeper, at \$2,100, in the office of the Treasurer of the United States; one bookkeeper, at \$2,400, in the office of the Treasurer of the United States in connection with national currency reimbursement, and one assistant bookkeeper, at \$2,000, in the same office; one bookkeeper, at \$2,000, and one assistant bookkeeper, at \$2,000, in the office of the Comptroller of the Currency.

In the Department of Justice, also, they have a chief bookkeeper at \$2,000. I therefore think \$2,000 would be a proper salary for our supervising bookkeeper..

The CHAIRMAN. Have you anything further to say in connection with the increase of clerks submitted.

Mr. ZAPPONE. I have not, sir, unless some member of the committee desires to ask some questions.

The CHAIRMAN. There is a note to the effect that two clerks at \$840 and three clerks at \$720 have been dropped.

Mr. ZAPPONE. That is for the purpose of eliminating those low-grade places at \$720 and \$840. I have increased the places at \$900. It is very difficult to get from the Civil Service Commission at that low salary people who are capable of performing acceptable work in my office. On account of the present high cost of living, I can not get acceptable clerks at \$720 and \$840, and as a result I practically have to recruit that portion of my roll from the messenger service of the department—from messengers who have since taken the clerk's examination and have gotten on the eligible list. That

is not the best of clerical material, by any means. I believe that if these places are raised to \$900, I can get a better class of men from the Civil Service Commission to fill them. But I shall not urge this change very strongly, sir. The positions may stay just as they are at present, if you so desire.

The CHAIRMAN. You submit an estimate for an additional messenger?

Mr. ZAPPONE. I feel that it is necessary, sir. My working force at present is so divided that the division occupies three floors in the west end of the main administration building; and one messenger can not handle with dispatch the volume of work to be done. As a result, I have to call on such assistance as I can get from the bureaus by telephoning them to send their messengers over and otherwise. Sometimes, also, I use the messengers of the Secretary, in the hall. I should like to have a messenger on one of the upper floors. I feel that it would assist the work very much.

The CHAIRMAN. Referring again to the provision you have inserted here to permit the deputy disbursing clerk to sign checks, do you, yourself, sign the checks for the department by authority of a general statute?

Mr. ZAPPONE. Yes, sir.

The CHAIRMAN. Which applies to all the departments of the Government?

Mr. ZAPPONE. Yes, sir; a general statute.

The CHAIRMAN. There is not any statute existing now by which that duty could be assigned to a disbursing clerk by order of the Secretary or by your action?

Mr. ZAPPONE. Only in the case of sickness or other absence from the department. When present I must sign the checks. I can not delegate that to anyone else. If I should be taken suddenly sick, there is a statute under which the Secretary may appoint some one to act temporarily during my absence. The Government has provided that statute so that its work shall not be crippled; but there must of necessity be a small delay. I feel that this provision, if incorporated in the bill, will have a good chance to go through, having the precedent of the provision for the Treasury Department as inserted in the legislative bill of last year.

Mr. LAMB. That was done last year for the Treasury Department, I know.

Mr. ZAPPONE. Yes, and I am asking for no additional money for the purpose; I am merely asking for a law to protect the department. The salary is already provided for under another title—that of a fiscal agent, at \$2,000.

The CHAIRMAN. Have you anything further to suggest?

Mr. ZAPPONE. Nothing unless the committee wishes to ask some questions.

The CHAIRMAN. If there are no further questions, we will not detain you further. We are much obliged to you.

Mr. ZAPPONE. You are quite welcome, sir. I have with me copies of all the fiscal and other departmental reports mentioned in my testimony, in case you would like to see them.

The CHAIRMAN. Yes; I should like to see them.

Mr. ZAPPONE. I will leave them.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 15, 1910.

AFTERNOON SESSION (CONTINUED).

The CHAIRMAN. Mr. Arnold, the Chief of the Division of Publications is here. We shall be glad to hear any general statement that he may wish to make prior to the discussion of the bill in detail.

**STATEMENT OF MR. JOSEPH A. ARNOLD, EDITOR AND CHIEF
OF THE DIVISION OF PUBLICATIONS, DEPARTMENT OF
AGRICULTURE.**

Mr. ARNOLD. Mr. Chairman and gentlemen, I think I have heretofore outlined to you the work of the division; but with your permission I should like to submit the following brief statement with regard to its general duties and responsibilities:

The Division of Publications has no projects. It does not originate any new work. The work does not differ from year to year, the only variation being in the amount of work it performs for the Secretary and the various bureaus, divisions, and offices of the department. It is the publishing house of the department and is also the medium of communication between the department and the public. All the details in regard to the publication work, including printing and binding, are under the supervision and direction of this division. One of the most important duties of this division is the supervision of the expenditure of the fund for printing and binding, amounting to \$460,000. This feature of the division's work does not appear in the appropriation for its support. I have sometimes thought that the appropriation for printing and binding should be included in the appropriation for this division. However, the Committee on Printing has not taken that view of the matter, preferring to centralize all appropriations for printing under the heading "Printing and binding" in the act making appropriations for sundry civil expenses of the Government. If this amount be added to the appropriation for this division the aggregate fund under the supervision of this office would be over \$700,000. Inasmuch as the volume of work performed by this division during the last fiscal year exceeded that of any previous period in its history, it seems appropriate to review in detail the character of the work devolving upon the division.

This division is charged with editing, illustrating, indexing, and distributing all of the publications of the department, of which last year there were more than 1,900 separate and distinct documents, the total number of printed copies of which aggregated more than 25,000,000, of which about 9,000,000 were Farmers' bulletins.

The work of the division is very naturally divided into four sections, namely, editing, illustrating, indexing, and distributing. With

regard to each of these I desire to speak somewhat in detail, and will take them up for consideration in the order mentioned.

By direction of the Secretary all manuscripts intended for publication are submitted to the Division of Publications. There they are placed in the hands of editors, who read, correct, and criticize them. The editors in their reports describe the general scope and character of the publications and offer any suggestions that they may have to make with regard to improvement, all of which are included in the reports made to the Secretary by the chief of the division. The printing of any publication is not undertaken until it has been approved by the Secretary. In this reading and criticism the editors are guided by the needs and purposes of the department as a whole, rather than any bureau, and they give particular regard to the suitability of the material for publication and distribution. If, in our judgment, it would not serve a useful purpose, a recommendation to that effect is made to the Secretary. If the manuscript would be improved by reduction or elaboration, a suggestion to that effect is made. It is largely upon the editor's recommendation to print a publication, or to withhold approval, that the Secretary bases his decision. After the Secretary has approved the publication, the division makes up a scheme of distribution, adding to the number required for the lists of the originating bureau such number of copies as, in our judgment, is likely to be required to meet the popular demand. This division also adjusts any differences between the bureaus and reconciles any statements that might be contradictory to those in some other publication. If any references are made to subjects which come within the province of some other bureau, the approval of that bureau is secured or the differences adjusted to the satisfaction of both bureaus. After all of the preliminary work has been performed upon the manuscript and it has been made to conform to the Secretary's instructions with regard to it, a requisition is drawn upon the Public Printer. This gives instructions with regard to size, style, paper, and all other details in connection with the work. In due time proof is received and read in this division, as well as in the originating office, after which it is returned to the Government Printing Office.

Delivery of the completed work to the Division of Publications usually takes place in the course of from ten days to two weeks after return of final proof to the Government Printing Office. The opportunities for the practice of economy in the publication work are numerous and are always seized upon by this division, the object being to secure for the department the greatest possible output of work with the available appropriation. Let me mention an illustration or two of the opportunities of which I speak. The Experiment Station Record is a publication of 100 pages and is issued about 18 times a year. For a long while it was sewed; that is to say, the printed sheets were assembled and sewed together by hand, involving considerable time and expense. Now the Record is wire stitched; that is to say, the sheets are put together and fastened by wire put through the sides near the back. The saving effected by this change amounts to about \$3,200 per year for this single publication. Frequently it is found that after a manuscript is put into proof it makes, say, 18 pages, which is not an economical size for printing. This division, by rearrangement, condensation, or omission of matter, reduces it

to 16 pages, and thereby on an edition of 20,000 copies effects a saving of about \$50. Requests are frequently received for blanks which are of such dimensions that they can not be economically cut from paper of the standard size. This office alters the dimensions of the desired blank without in any way interfering with its usefulness, thereby greatly reducing the cost. Instances of this kind are of daily occurrence in this division. The same supervision is exercised over all printing and binding of the department. The editors upon whom this work devolves are well qualified to perform it on account of their education and experience with regard to such matters.

The division endeavors in every way to be helpful to the various bureaus, divisions, and offices in securing for them the printing and binding they require.

If a publication makes 50 or 60 printed pages, a detailed subject index is prepared by a force which has been assembled for that purpose and is prepared to do all indexing required.

The illustrations to accompany a publication are prepared in the illustration section, where draftsmen and photographers are employed. The number of drawings made last year was 1,460, while the number of photographs aggregated 99,122. Many of the photographs are not used in publications, but are preserved as part of the record of experiments conducted by the various bureaus, divisions, and offices. Lantern slides are also prepared and are extensively used in demonstration work and by lecturers who are sent out by the department.

The distribution of the enormous number of the various publications of this department is a work of considerable magnitude, over 140 persons being exclusively employed in such service. As soon as a publication is received from the printer it is sent out in accordance with the scheme of distribution previously arranged, leaving only a supply on hand for miscellaneous distribution. From this supply the publications are sent to miscellaneous applicants until the edition is exhausted, after which, if no funds are available for reprinting, applicants are referred to the superintendent of documents. It is the policy, however, to keep in stock those publications for which there is a demand; in other words, to give to the people what they most want. Unfortunately, it is not always possible to supply applicants with everything they ask for, some of them requesting large numbers of the same or different bulletins, in which case we can not, of course, supply all, sending a few, of which the applicant is advised by a printed slip accompanying the publications mailed to him. About 3,000 letters are received daily in this division, or are referred to it by the Secretary, and the work connected with answering them, deciding what publications should be sent, and mailing the publications is of very great magnitude. It is, however, kept up to date.

I should like to state also what is a fact with regard to the Division of Publications in the Department of Agriculture, and that is that it is the only similar division separately and independently appropriated for in the Government service. It has been in existence now for 21 years. Similar editorial or publishing sections have been established in practically all the other departments of the Government, perhaps the largest and most recent one being in the Department of Commerce and Labor; but so far the magnitude of the work performed by them has not attained to that of the Division of Publica-

tions of the Department of Agriculture. As a matter of fact, there is no other government that distributes the number of publications that the Government of the United States distributes, and no other department of the Government distributes as many publications as the Department of Agriculture, all of which are distributed by the Division of Publications. I will now take up the estimates in detail.

The second item, Mr. Chairman (omitting the first one, as that concerns me, and I would rather not speak of it, preferring to leave that entirely to your decision), is for two assistant editors, at \$2,000 each, increase of one submitted. I should like to consider at the same time the two following items.

At the present time there are in the Division of Publications two assistant editors at \$1,400, four at \$1,600, and one at \$2,000. It is proposed by these estimates to promote one of the \$1,600 men to \$2,000, promote the three remaining ones to \$1,800, and promote one of the \$1,400 assistant editors to \$1,600, leaving only one at \$1,400. I should like to make a special plea to you gentlemen in behalf of these men. They have been in the service of the department for periods varying from five to ten years at the salaries they are now receiving, and they are rendering very efficient service. They are the men who criticize and review the matter submitted for publication, and I feel safe in saying that it is upon their judgment and recommendations that the Secretary is largely influenced in deciding whether the matter shall be printed or not. They are rendering expert service which, in my judgment, in a large publishing house or a metropolitan newspaper would command from \$40 to \$60 a week.

The CHAIRMAN. Have you no \$1,800 place now for one of these editors?

Mr. ARNOLD. We have not. As you will see farther on, we have an indexer; but we have no editorial clerk at \$1,800.

The CHAIRMAN. So that when a man reaches \$1,600 the only promotion you could give him under the present arrangement would be to \$2,000?

Mr. ARNOLD. Yes, sir.

Mr. LAMB. Who is this one editor?

Mr. ARNOLD. Which one?

Mr. LAMB. "One editor, who shall be assistant chief of division."

Mr. ARNOLD. That is Mr. Stallings.

Mr. LAMB. Yes; that is what I thought.

Mr. ARNOLD. No estimate for an increase is made for him, although in my judgment he is certainly entitled to it.

Mr. LAMB. Why is one asked for these others and not for him?

Mr. ARNOLD. I do not know, sir. I recommended it most strongly.

Mr. LAMB. Who is the assistant editor? Here is "one assistant editor at \$1,600." Who is he?

Mr. ARNOLD. We have four at \$1,600.

Mr. LAMB. But I see one by itself here. There are three up above that.

Mr. ARNOLD. There is one at \$2,000. Perhaps that is the one you refer to—"One assistant editor, \$2,000." That is Mr. Handy.

Mr. LAMB. I see no recommendation there for him.

Mr. ARNOLD. No, sir.

Mr. LAMB. Did you make any for him, too?

Mr. ARNOLD. I thought that we would be satisfied with the promotions of the other deserving editors receiving less salary who had not been promoted for many years.

The CHAIRMAN. I suppose that in putting in one assistant editor at \$1,400, you wanted to have one position on the rolls at that salary as an entering position?

Mr. ARNOLD. That is the idea, Mr. Chairman.

The next item is an increase of \$200 submitted for the assistant in charge of indexing. This gentleman has been receiving a salary of \$1,800 for a period of seven years. He is in charge of a force which has been organized to do the indexing required for our publications. He also prepares and maintains a card-index by subjects of all the publications of the department, by reference to which one can ascertain easily what the department has published on any given subject. On account of the service this assistant is rendering, he is entitled to this slight increase of \$200.

The next item is an increase of \$100 for one draftsman or photographer. The position is really that of a draftsman; and I should like to add that I consider him one of the best, if not the very best, all-around draftsmen in the city of Washington. I think that the \$100 increase is certainly deserved. It is not as much as I think it ought to be.

The CHAIRMAN. Have you any information as to the salaries paid men in similar employments in private offices about town?

Mr. ARNOLD. I am not fully advised in regard to that. I only know that they pay them all the way up to \$1,800 in other branches of the Government. I do not know what they pay in private establishments.

The CHAIRMAN. I presume that what you say about him would apply to the other two in the following item?

Mr. ARNOLD. I should like to say a word about that next item.

Mr. LAMB. Before you do that let me ask you this question: I see here that you have "one assistant in charge of illustrations, at \$2,000."

Mr. ARNOLD. Yes, sir.

Mr. LAMB. And the indexing clerk gets \$1,800?

Mr. ARNOLD. Yes, sir.

Mr. LAMB. What is the difference between the work of those two people?

Mr. ARNOLD. I really think the assistant in charge of indexing should have been promoted at the time the assistant in charge of illustrations was promoted.

Mr. LAMB. That is what I wanted to ask you.

Mr. ARNOLD. For some reason it was not done.

Mr. LAMB. Was that last year, or year before?

Mr. ARNOLD. Oh, that has been several years ago. He is in charge of a section of the division, and as such, I think, is entitled to \$2,000, the same as the other assistants in charge of sections.

I want to say in regard to one of the draftsmen at \$1,500, where an increase of \$100 is proposed, that he made for the Bureau of Chemistry all the drawings and specifications of the fixtures in the new building now occupied by the bureau. I have been told by the assistant chief of the bureau that if those specifications and plans

had been procured from a draftsman outside they would have cost the department over \$3,000.

The CHAIRMAN. Do you remember how much of his time was taken in doing that work?

Mr. ARNOLD. I can not state that. I know that while he was not employed exclusively at it, that was his principal work for a period of a year, I should say—not exclusively.

There is an item of an increase of \$60 for one photographer, making the salary \$900. It is believed that this slight increase ought to be made.

The CHAIRMAN. That is for your assistant photographer?

Mr. ARNOLD. That is "one assistant photographer"—\$900 instead of \$840.

The CHAIRMAN. Yes.

Mr. ARNOLD. The next item is "One foreman of miscellaneous distribution; increase of \$100 submitted." He is in charge of the distribution of all publications other than farmers' bulletins.

I ought to say more on behalf of those draftsmen. There are only three of them at the present time. They work very hard, overtime, and frequently on Sundays. I really feel that the extra \$100 is a very little promotion in recognition of their service. I may add that the entire force, draftsmen and photographers, is overworked and underpaid.

The CHAIRMAN. Just a word further in regard to this foreman of distribution: Can you say of him also that it is necessary for him to work overtime?

Mr. ARNOLD. He frequently does. He has been there for about seventeen years. He almost never takes leave of any kind.

Mr. LAMB. What is his name?

Mr. ARNOLD. That is Mr. Hendricks.

Mr. LAMB. That is not his title now, is it?

Mr. ARNOLD. "Foreman, miscellaneous distribution;" yes, sir. That means he has immediate charge of the mailing of the miscellaneous publications other than farmers' bulletins.

Mr. LAMB. I thought he was assistant editor.

Mr. ARNOLD. No, sir; this is Mr. Hendricks that we are speaking about now; not Mr. Handy.

The CHAIRMAN. Are the duties of the foreman of miscellaneous distribution sufficiently more arduous or responsible than those of the foreman of farmers' bulletin distribution to warrant the difference of \$400 in their salaries?

Mr. ARNOLD. More miscellaneous publications are distributed than farmers' bulletins. More than 9,000,000 farmers' bulletins were distributed, whereas about 15,000,000 miscellaneous publications were distributed. That is the difference.

I want to say to you while we are speaking about farmers' bulletins that most of the farmers' bulletins which we send out upon request the of you gentlemen here are put up and sent out by women. They do it very well, I think, and very promptly.

The CHAIRMAN. Have you any further comment to make on the roll as it appears anywhere?

Mr. ARNOLD. There is another item, Mr. Chairman—"Seven clerks, class 1; increase of two submitted."

The CHAIRMAN. Where there is merely an increase in the force without any change in the compensation, will you just include it all

in one comment and give us in a general way your reasons for thinking the increase ought to be given?

Mr. ARNOLD. I was going to say that since this estimate of two additional clerks at \$1,200 was submitted I have concluded to ask you to reduce that to two clerks at \$1,000. I am of the opinion that that will be sufficient compensation for the clerks we propose to obtain.

The CHAIRMAN. Just where is that?

Mr. ARNOLD. "Seven clerks, class 1; increase of two submitted, \$8,400."

The CHAIRMAN. You think you can strike out that "increase of two submitted?"

Mr. ARNOLD. Yes, sir; make that "five clerks, class 1," and it will be satisfactory to me.

The CHAIRMAN. You have not any other surprises of that kind in store for us, have you?

Mr. ARNOLD. I am sorry I mentioned it, if you were going to pass it. That would necessitate the changing of "ten clerks" to "twelve clerks at \$1,000."

The two additional clerks are needed in the document section; and it is proposed to employ men. Of the force of 140 people there I think we have only eight male clerks, while at least two more are believed to be required. We have quite a number of skilled laborers and laborers who are men, but we are short on male clerks.

The CHAIRMAN. Do you have in your division cases where men and women working side by side and doing practically the same work are paid different salaries?

Mr. ARNOLD. We do not have men and women working side by side doing the same work.

The CHAIRMAN. In the main, do you endeavor to pay an equal salary to people doing similar work?

Mr. ARNOLD. That is the object. We can not always do that. The force has to be adjusted and put at any sort of work that happens to be required, and that is most urgent at the time. Sometimes the clerks do skilled laborers' work, and vice versa, and it should be said to their credit that they do all the work assigned to them cheerfully and efficiently.

The CHAIRMAN. Very good. Have you anything further to suggest on this roll?

Mr. ARNOLD. There is one other general statement I want to make; and that is as to a recommendation for a change in the titles of the clerks and of skilled laborers, so as to provide for clerks and skilled laborers.

The CHAIRMAN. You have it here, "Clerks or skilled laborers."

Mr. ARNOLD. I should say, "Clerks or skilled laborers." The reason for the change in title is that in the event of a vacancy it would be possible to appoint and employ a clerk or a skilled laborer, as the exigencies of the service might require.

Mr. COCKS. Is there any difference in their duties?

Mr. ARNOLD. There is. Clerks are used as stenographers, typewriters, bookkeepers, keeping records and files and making orders, etc. Skilled laborers assemble publications, put them in envelopes, and seal them. They also put them in sacks and carry them on trucks to the wagons to be delivered to the post office, to the Senate and House buildings, and other places. They also assist in loading and unloading publications. Formerly many clerks were employed

addressing envelopes. Now that this work is done by machinery, they are performing other work. When necessary, they are put at light skilled laborers' work. With the change recommended, it would be possible to appoint skilled laborers in the places of clerks when vacancies occur.

Following out that plan, Mr. Chairman, we combine the 25 clerks at \$840 on the present roll and the 15 skilled laborers at \$840, which gives us 40 clerks or skilled laborers.

Mr. LAMB. That is in this note down here, is it not?

Mr. ARNOLD. Is it? I had not noticed that.

Mr. LAMB. There is a note at the bottom there.

Mr. ARNOLD. Then there are "15 skilled laborers." I should be glad if you would change that to "15 clerks or skilled laborers." The 32 clerks at \$720 and the 19 skilled laborers at \$720 are combined in the estimate of 50 clerks or skilled laborers, one being transferred to the Secretary's roll.

The CHAIRMAN. That is clear enough.

Mr. ARNOLD. It is clear enough, I think.

There is one change very near the end—four charwomen, at \$480 apiece. It is proposed simply to employ one more for a whole day rather than half a day, and decrease the number employed for half a day.

The CHAIRMAN. Passing to your general provisions: Have you any change there at all?

Mr. ARNOLD. I believe there is no change in the total amount.

The CHAIRMAN. What is the situation now with regard to your mailing device? Have you got the office entirely equipped with up-to-date labor-saving machines?

Mr. ARNOLD. I do not know that we are entirely equipped. We have been adding machinery, as you know, from time to time. We now have four small electric addressing machines, averaging 10,000 per day each; three foot-power addressing machines, averaging 9,000 per day each; one large electric addressing machine, averaging 22,000 a day; three electric stencil-cutting machines, averaging 500 each per day; two foot-power stencil-cutting machines, averaging 300 each per day; and five electric paper-folding machines averaging 18,000 each per day. I ought to state that, as you know, we have been gradually taking over the mailing lists of all the bureaus, divisions, and offices, and they are now practically all in our possession and on stencils. There is but one list yet to be turned over to us from the Bureau of Animal Industry, which I think consists of about 900 or 1,200 names.

The CHAIRMAN. Can you state from memory what mailing lists you have that are permanent?

Mr. ARNOLD. Yes, sir. Let me say that each bureau has a mailing list, which is usually subdivided by professions or occupations; and when it is contemplated to mail a bulletin only that portion of the list is used to which the publication would be likely to be of interest. We have on stencil in our office at this time 754,332 names and addresses. That does not mean that any considerable portion of that number is used for any single publication. For instance, the Bureau of Plant Industry has a list here of 29,387 names.

The CHAIRMAN. That list is made up, I suppose, of their cooperators and collaborators throughout the country?

Mr. ARNOLD. Yes, sir. When a bulletin is ready to mail, they make an order on us to do the mailing, and we put the bulletin in an envelope and address it and put it in the mail.

The CHAIRMAN. Will you continue, and let us have that complete list if you have it?

Mr. ARNOLD. Yes; I have it here. I can submit it.

The CHAIRMAN. I wish you would do this. We will not detain the committee to have you read it now; but I should like to have you insert in the record at this place a statement beginning, as you did there, with the aggregate number of names that you have on stencil; then the items that make up that aggregate, indicating after or in connection with each one the class of persons included.

Mr. ARNOLD. Yes, sir; I shall be very glad to do so.

The aggregate number of names on stencil is 754,332. The number maintained on the mailing lists of the various bureaus, divisions, and offices, with the subdivisions or items thereof showing classes or occupations of persons, is given in the following statement:

Mailing lists on stencils maintained in the Division of Publications.

BUREAU OF ANIMAL INDUSTRY.¹

[P, used for publications; R, used for regulations; S, used for Service Announcements; X, used for other purposes (circular letters, blank forms, etc.)]

General mailing list:	Number of names.
PR. List A (practically all publications of bureau).....	55
P. Scientific (scientists).....	56
P. Medical science (principally city health officials).....	103
P. Veterinarians.....	180
P. Zoological.....	18
PRX. Breeders' associations.....	68
P. Live stock.....	66
P. Poultry.....	25
P. General.....	66
P. Popular.....	23
PRSX. State veterinarians.....	75
PRSX. State officials.....	148
PRSX. State boards of health.....	41
	<hr/> 924 <hr/>
Lists to which only regulations are sent:	
R. Regulations (miscellaneous).....	40
R. Meat inspection.....	99
R. Transportation companies.....	800
	<hr/> 939 <hr/>
Press list (mostly newspapers in tick territories).....	850
(Other press lists are made up specially from newspaper directory as occasion requires, and are not kept in type.)	
SX. Packing houses.....	850
RX. Railroads (receipts for regulations).....	210
XP. Dairy organizations.....	404
X. Cooperative creameries.....	2,067
X. Individual creameries.....	2,865
X. Cooperative cheese factories.....	365
X. Individual cheese factories.....	3,100
P. Foreign (institutions, exchanges, cooperators, etc.).....	300
PRSX. Employees (inspectors in charge of stations, etc.).....	225
	<hr/>
Total for Bureau of Animal Industry.....	13,099

¹ This list is not as yet maintained in the Division of Publications. It is included here, however, in order to show the complete departmental mailing lists.

BIOLOGICAL SURVEY.		Number of names.
Domestic list (individuals specially interested, or cooperating).....		760
Canada, Cuba, and Mexico (individuals specially interested, or co- operating).....		63
Press list (newspapers—sporting and game).....		54
Total.....		877

BUREAU OF CHEMISTRY.		
Importers list.....	945	
Miscellaneous importers list.....	1,887	
Foreign list (individuals and institutions).....	192	
Chemistry general list.....	246	
Foreign Trade Journals.....	63	
Canada, Cuba, and Mexico list.....	48	
Director Chemist list (not on Office of Experiment Stations list of chemists).....	15	
Food and dairy.....	123	
Food officials, food chemists.....	223	
Domestic trade journals.....	191	
Agricultural Experiment Stations.....	55	
Library list.....	53	
Food officials, secretaries boards of pharmacy list.....	53	
Food officials, superior officers list.....	58	
Special Food Inspection Decision list.....	34	
Branch laboratories list.....	21	
Miscellaneous list.....	38	
Foreign embassies and legations.....	36	
Association Official Chemists list.....	8	
Municipal chemist list.....	67	
Sugar list.....	3	
Insecticides list.....	1	
Plant analysis list.....	1	
Leather and paper.....	3	
List of ports to receive food inspection decisions.....	20	
Total.....		4,384

BUREAU OF ENTOMOLOGY.		
Domestic list (persons specially interested or cooperating).....	527	
Canada, Cuba, and Mexico (persons specially interested or cooper- ating).....	28	
		555

BUREAU OF PLANT INDUSTRY.		
Domestic list (persons specially interested or cooperating).....	139	
Foreign list (same).....	60	
Canada, Cuba, and Mexico (same).....	10	
Directors, agricultural experiment stations, etc.....	204	
Total.....		413
Drug plant investigations:		
Miscellaneous list (persons specially interested or cooperating).....	257	
Drug journals.....	49	
Medical journals.....	54	
Colleges of pharmacy.....	75	
Boards of pharmacy, secretaries.....	51	
Foreign (persons specially interested or cooperating).....	12	
Canada (persons specially interested or cooperating).....	5	
Farmers' cooperative demonstration list.....	28,332	
Agents' list.....	157	
Total for Plant Industry.....		28,992

FOREST SERVICE.

Number
of names.

Forest Service Press Bulletin list.....	4, 059
List I, formerly List A, agricultural journals.....	363
Forest supervisors.....	152
Lumber trade journals.....	140
Library list.....	1, 681
Special list (Forest Service members, scientific).....	759
Special list, Canada, Cuba, and Mexico (persons specially interested).....	44
Foreign list, schools, and persons specially interested.....	41
Foreign list, government officials and persons specially interested....	138
Foreign list, associations.....	10
Foreign list, botanical gardens.....	11
Foreign list, libraries.....	7
	92
	82
Civic societies.....	13, 946
Legislators.....	7, 137
Electrical.....	8, 785
Box factories.....	2, 649
Hardwood associations.....	544
Tanneries.....	972
Railways.....	16, 431
Mining experts, contractors, and operators.....	15, 816
Tight cooperage, persons interested.....	1, 219
Forestry associations.....	1, 836
Slack cooperage, persons interested.....	2, 135
Turpentiners.....	1, 160
Wood preservers.....	1, 989
Veneer manufacturers.....	586
Chemical industries.....	3, 305
Engineers.....	6, 766
Lumber manufacturers.....	8, 286
General (any applicant for publications).....	3, 160
Stockmen.....	33, 883
Farmers interested in forestry.....	210, 597

Total..... 348, 983

LIBRARY.

Bulletin list (to which is sent Library bulletins).....	267
Bulletin list, foreign (to which is sent Library bulletins).....	2
Libraries, domestic list (librarians in the United States).....	148
Libraries, foreign list (librarians in foreign countries).....	48
Libraries, Canada, Cuba, Mexico list.....	8
Libraries, foreign farmers' bulletin list (libraries and individuals).....	63
Libraries, Canada, Cuba, Mexico farmers' bulletin list (miscellaneous list).....	13
Total.....	549
Foreign monthly list:	
Library (librarians).....	954
Publications (miscellaneous).....	1, 810
Canada (miscellaneous).....	1, 096
Cuba (miscellaneous).....	164
Mexico (miscellaneous).....	130

Total..... 4, 703

DIVISION OF PUBLICATIONS.

	Number of names.
Library list, division of publications (State librarians principally)...	367
List A, No. 1 (newspapers, agricultural and stock principally).....	1, 227
Embassies and legations in Washington.....	41
Indian school superintendents.....	123
State agricultural officials, No. 2, A (commissioners of agriculture)...	22
State agricultural officials, No. 2, B (governors and agricultural officials).....	93
Monthly list (miscellaneous individuals).....	213, 766
Grange list (individual members of granges).....	25, 000
Washington correspondents.....	214
Total	240, 853

CONGRESSIONAL LIST.

Senate, city addresses.....	96
House, city addresses.....	394
Senate, home addresses.....	92
House, home addresses.....	385
Total	967

ROAD INQUIRY.

Domestic list (miscellaneous individuals, civil engineers, etc.)....	3, 622
Foreign (same, only foreign).....	11
Cuba (same, in Cuba).....	2
Canada (same, in Canada).....	5
Total	3, 640

SOLICITOR'S OFFICE.

United States attorneys and federal judges.....	207
General list (principally officials having charge of the enforcement of the meat inspection and pure food laws).....	37
Notice of judgments list (food officials).....	36
Total	280

BUREAU OF SOILS.

Special list (persons specially interested or cooperating).....	255
Special list journals (various domestic papers).....	35
Foreign list (principally foreign institutions).....	174
	464
Canada (miscellaneous individuals and institutions).....	39
Cuba (same).....	5
Mexico (same).....	6
Total	514

BUREAU OF STATISTICS.

State statistical agents.....	45
Special field agents.....	17
Mimeograph list (miscellaneous individuals).....	316
Foreign list (individuals and institutions).....	258
County correspondents.....	2, 802
Crop Reporter list (individuals).....	60, 000
Township list (individuals).....	31, 497
Robinson Crop Reporter list.....	1, 949
Special price list (individuals).....	6, 703
Total	103, 587

OFFICE OF EXPERIMENT STATIONS.

	Number of names.
Farmers' Institute list of local managers.....	3, 645
Newspaper list.....	159
Experiment Station Record list.....	1, 253
Canada, Cuba, and Mexico Record list.....	110
Farmers' list (selected farmers).....	1, 439
Farmers' list, Canada, Cuba, Mexico.....	22
Nutrition list, institutions.....	254
Nutrition list, individuals.....	432
Nutrition list, individuals, Canada, Cuba, and Mexico.....	7
Station publications (individuals receiving list of station publica- tions).....	1, 446
Station publications, Canada, Cuba, and Mexico (same).....	39
Agricultural educational list.....	4, 426
Farmers' Institute lecturers.....	1, 020
Irrigation investigations list 1 (to whom all publications are to be sent, consisting of libraries, educational institutions, the press, State and foreign officials connected with agriculture, teachers of agricultural subjects allied to irrigation, and persons connected in any way with the work of the department).....	233
List 2 (The use of water in irrigation, consisting of persons inter- ested in the practical questions connected with the use of water, such as preparing land for irrigation, building ditches, distributing water, and applying water to crops).....	367
List 3 (pumping, consisting of persons interested in the pumping of water for irrigation).....	40
List 4 (reservoirs, consisting of persons interested in the building of reservoirs and in storing water for irrigation).....	4
List 5 (laws and institutions, consisting of persons interested in irri- gation laws, the organization of irrigation enterprises, the opera- tion of irrigation districts, Carey Act projects, etc.....)	1
Foreign.....	1
Total.....	14, 898
Grand total.....	767, 332

It appears that the list is very large; but, as I stated a moment ago, it is not to be inferred that anything that we get out goes to the entire list. In our judgment that would be a wasteful distribution.

The CHAIRMAN. You do not maintain a miscellaneous list upon which you enter the names of any individual citizens throughout the country who may send in and desire to receive, for example, all of your farmers' bulletins as they are published?

Mr. ARNOLD. We have no such list. We have a great many requests of that kind, and we simply write and advise the applicant that we have put his name on the list to receive the Monthly List of Publications, which is issued about the first of each month, from which he can select and apply for any publications that may be of interest to him.

The CHAIRMAN. You do maintain a list for the distribution of that list of publications?

Mr. ARNOLD. We have a list of 260,000, I think, at this time. We send out the publications of the department as long as they are available for distribution. When we are out, and have no more money to reprint additional copies, then we take advantage of the law. We are obliged to; that is all.

Mr. LAMB. What becomes of your city quota—the men in these large cities? They do not send for these publications, do they?

Mr. ARNOLD. They frequently transfer them to members from the rural districts. However, many of the city members use the bulletins, many of which are suitable for such distribution.

Mr. LAMB. It does not seem to me that they have much need for them.

The CHAIRMAN. Are there any further questions on the Division of Publications?

Mr. HAWLEY. I observe that on page 71, in the second item, you strike out the word "current."

Mr. ARNOLD. That is under the fund for general expenses. The word "current" is taken out there for the reason that by some arrangement (with which I am not now familiar) we do not have to pay for the electric current.

The CHAIRMAN. Have you been able heretofore, under this or any other paragraph, to purchase electric fans?

Mr. ARNOLD. We have purchased fans, several of them, during the last summer.

The CHAIRMAN. From what fund did you take the money to do that?

Mr. ARNOLD. Without looking up the matter, sir, I could not say; but I imagine from that appropriation.

The CHAIRMAN. Why not from "office furniture and fixtures?"

Mr. ARNOLD. Possibly so. I really do not remember about that, Mr. Chairman. Mr. Zappone might help us on that point.

The CHAIRMAN. Mr. Zappone, what would you say about that?

Mr. ZAPPONE. I should say it would be from "office furniture and fixtures."

The CHAIRMAN. That being the case, why not strike out that provision? Since you no longer need authority for buying electric current and already have authority for buying electric fans, why should you say anything about electricity?

Mr. ARNOLD. I think it might be omitted.

The CHAIRMAN. Just what arrangement has been made, Mr. Zappone, which obviates the necessity of buying current?

Mr. ZAPPONE. The current is furnished by the power plant of the department. When it is necessary to go outside and buy current from the Potomac Electric Power Co. (which is done in the case of machinery) payment therefor is made from the contingent fund. We have tried to centralize all such charges under that fund. I would suggest to the committee that the language be allowed to remain just as it was originally—"electric current"—because at some time the Division of Publications may have to rent a building outside, and it would therefore be just as well to allow the specific language to remain in the bill. The word "fans" is really superfluous. Under the law we have ample authority to purchase fans.

The CHAIRMAN. I think that is a good suggestion.

Mr. HAWLEY. Then the decrease in that item from \$1,500 to \$500 is due to the fact that you no longer need to buy electric current, or to the transfer of some employee to the statutory roll?

Mr. LAMB. That is explained in the note down there.

Mr. ARNOLD. Yes, sir; because we do not expect to have to pay for electric current for light or machinery.

Mr. LAMB. Read that note down below there.

Mr. HAWLEY. Oh, yes; I see that that is explained in the note.

Mr. ARNOLD. Yes, sir.

Mr. HAWLEY. The decrease is due to the fact that you no longer purchase current.

The CHAIRMAN. Are there any further questions? Have you anything further to offer, Mr. Arnold?

Mr. ARNOLD. Nothing further, I believe, except to express a willingness to answer any questions you gentlemen desire to ask.

The CHAIRMAN. Are there any questions to be asked? If not, the committee will adjourn until to-morrow at 10.30 a. m.

(The committee thereupon adjourned until to-morrow, Friday, December 16, 1910, at 10.30 o'clock a. m.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Thursday, December 15, 1910.

The committee met at 10 o'clock a. m., Hon. Charles F. Scott in the chair.

(The committee, having finished the consideration of other matters before it, gave a hearing to a number of boys from various Southern States who had won prizes offered by the Department of Agriculture for the largest yield of corn grown under specified conditions.)

The CHAIRMAN. The members of the committee will remember that an appointment was made for 10.15 o'clock this morning with the young gentlemen who were the winners in the various corn-growing contests that were held in the various Southern States during the last summer; but when that hour arrived the visitors were attending a reception at the White House to meet the President, so we have proceeded with our work. The boys are here now, however, and I should like to inquire of Mr. Martin, who, I believe, is the conductor of the party, whether any of the boys themselves would like to be heard or whether he will speak for them? The committee would like, I would say, to have just a brief statement covering, perhaps in some average case, the method that was followed.

STATEMENT OF MR. O. B. MARTIN, SPECIAL AGENT, UNITED STATES DEPARTMENT OF AGRICULTURE.

Mr. MARTIN. Mr. Chairman and gentlemen, I do not know whether the boys would feel like making a set speech or not in this presence, but any questions that you would like to ask they will be glad to answer. This work has been organized by the Department of Farmers' Cooperative Demonstration Work, under Dr. Knapp. After the men's work was organized the work in connection with the boys was taken up in a small way at first. Last year 12,400 boys took part in it, and this year 46,225. The same general agricultural instructions that are sent to the men are sent to the boys. At first they receive circulars, and that is followed up by agents. The teachers frequently aid, and public-school officials, business men, bankers, and public-spirited citizens generally offer prizes for the best yield of corn in the county. There has been raised, by private subscription, over \$40,000 in the Southern States for this work and a prize trip to Washington from each State as kind of a climax to the whole thing.

I thought perhaps you would be interested in knowing the name and State of each boy, and I can tell you, as I introduce them, what their yields were, and what it cost each boy per bushel. The boys will be ready to answer any questions you may ask. I am afraid they would be unable to make set speeches to the committee.

The CHAIRMAN. We do not care for set speeches.

(Mr. Martin here introduced all of the boys present and also Mr. Stone, the father of one of the boys, to the committee.)

The CHAIRMAN. I would suggest that you furnish the stenographer a list of the names of all the boys, giving in each instance the address, the yield, and the cost per bushel.

Mr. MARTIN. I shall be pleased to do so.

The CHAIRMAN. I would like the figures to also show the market price of common corn at the different places, so that we can get an idea whether all of the extra work, the fertilizer, and that sort of thing involved in the production of these enormous crops would be a good investment for the general farmer.

(The information above referred to was subsequently furnished by Mr. Martin, and is as follows:)

Names.	Addresses.	Number of bushels.	Cost.
			<i>Cents.</i>
Hughey A. Harden.....	Banks, Ala.....	120	32
Ira Smith.....	Silver, Ark.....	119	8
Joseph Stone.....	Center, Ga.....	102½	29
Stephen G. Henry.....	Melrose, La.....	139½	13. 6
Wm. Williams.....	Decatur, Miss.....	146½	18
W. Ernest Starnes.....	Hickory, N. C.....	146½	38
Floyd Gayer.....	Tishomingo, Okla.....	95½	8
Jerry H. Moore.....	Winona, S. C.....	228½	43
Maurice Olgers.....	Sutherland, Va.....	168	40

In addition a second prize was given from South Carolina and one from the sixth Alabama congressional district. These were won by—

Names.	Addresses.	Number of bushels.	Cost.
			<i>Cents.</i>
Archle Odom.....	Bennettsville, S. C.....	177½	23
John Williams.....	Tuscaloosa, Ala.....	83½	49

The following table will show the cost per bushel of the corn of each boy's acre compared with the market price of corn in the States named, as given in the Crop Reporter, published by the authority of the Secretary of Agriculture, for the months of October, November, and December of 1910:

Names and States.	Cost as above.	Market price.		
		October, 1910.	November, 1910.	December, 1910.
	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>
Hughey Harden, Alabama.....	32	84	73	71
Ira Smith, Arkansas.....	8	62	60	58
Joseph Stone, Georgia.....	29	90	82	78
Stephen Henry, Louisiana.....	13. 6	68	60	55
Wm. Williams, Mississippi.....	18	74	66	63
Ernest Starnes, North Carolina.....	38	91	80	76
Floyd Gayer, Oklahoma.....	8	56	50	51
Jerry H. Moore, South Carolina.....	43	95	87	82
Maurice Olgers, Virginia.....	40	79	68	65
Archle Odom, South Carolina.....	23	95	87	82
John Williams, Alabama.....	49	84	78	71

The CHAIRMAN. The highest yield was 228.3 bushels, was it not?

Mr. MARTIN. Yes, sir; and it was the highest of the year, and next to the highest in the world's history.

Mr. LEVER. What was the highest yield per acre?

Mr. MARTIN. This is the highest in our work this year. The highest yield we ever had was 254 bushels, by Capt. Drake, of Marlboro County, S. C., 20 years ago.

Mr. MARTIN. When it comes to his net profit, it will be difficult to figure, because he is getting \$3 a bushel for all of his corn, for seed. I saw a man give him a check last week for \$6 for two bushels. He will get a little over \$600 for his seed corn.

The CHAIRMAN. What is the boy's name?

Mr. MARTIN. His name is Jerry Moore.

STATEMENT OF MASTER JERRY MOORE, OF SOUTH CAROLINA.

The CHAIRMAN. Jerry, let me ask you a question or two. How did you prepare your ground?

Master MOORE. I used two plows, one plow following in the furrow of the other, 10 inches deep.

The CHAIRMAN. When did you plow it?

Master MOORE. About the 20th or 25th of March.

The CHAIRMAN. Had it been plowed in the fall before?

Master MOORE. No, sir.

The CHAIRMAN. What had been in the ground the year preceding?

Master MOORE. Cotton.

The CHAIRMAN. Did you plant it immediately after plowing it with these two plows, or did you first harrow it?

Master MOORE. I did not harrow it. I let it stay 8 or 10 days.

The CHAIRMAN. And then you planted it?

Master MOORE. Yes, sir.

The CHAIRMAN. How did you plant it?

Master MOORE. I leveled it off.

The CHAIRMAN. Did you plant by hand or with a planter?

Master MOORE. I planted it by hand.

The CHAIRMAN. How close together?

Master MOORE. I just sowed it [illustrating].

The CHAIRMAN. Did you sow it broadcast?

Master MOORE. No, sir; I sowed it in the drill.

The CHAIRMAN. How close were the rows.

Master MOORE. Three and a half feet.

The CHAIRMAN. Three and a half feet apart?

Master MOORE. Yes, sir.

The CHAIRMAN. Did you plant the grain at any regular interval?

Master MOORE. No, sir; I sowed it, and then I thinned it out to six inches.

The CHAIRMAN. You thinned it out so as to leave one stalk each 6 inches?

Master MOORE. Yes, sir.

The CHAIRMAN. How much fertilizer did you use?

Master MOORE. I used 5,700 pounds of fertilizer.

The CHAIRMAN. Fifty-seven hundred pounds?

Master MOORE. Yes.

Mr. LAMB. On 1 acre?

Master MOORE. Yes, sir.

The CHAIRMAN. How did you apply the fertilizer? Did you spread it broadcast over the ground?

Master MOORE. I applied it in different ways. I put some under the corn at the start, and then I put it on each side of the row, and I kept on getting farther away. The last time I put the guano on was in the middle. I sowed it broadcast.

The CHAIRMAN. The first application of manure was with the grain when you planted it, was it?

Master MOORE. Yes, sir; under it.

Mr. STANLEY. What fertilizer was that?

Mr. LEVER. Ordinary commercial fertilizer?

Master MOORE. Yes, sir.

The CHAIRMAN. You first put the fertilizer in the furrow?

Master MOORE. Yes, sir.

The CHAIRMAN. And then you planted your corn?

Master MOORE. I put some dirt on the fertilizer, and then planted my corn.

The CHAIRMAN. And then you applied the fertilizer from time to time?

Master MOORE. Yes, sir.

The CHAIRMAN. Did you apply it at regular intervals? That is, did you apply the fertilizer every week or every two weeks?

Master MOORE. Yes, sir; every week or two.

Mr. LAMB. Did you work it perfectly level?

Master MOORE. Yes, sir; I barred it off once.

Mr. LAMB. You barred it off at first?

Master MOORE. Yes; and then I took that down with a harrow.

The CHAIRMAN. How did you cultivate the ground?

Master MOORE. Just with a harrow.

The CHAIRMAN. You did not plow it at all?

Master MOORE. I just barred it off once.

Mr. LAMB. Did you throw the furrow right straight back?

Master MOORE. Yes, sir.

Mr. LAMB. And when you threw the furrow did you run the harrow right along?

Master MOORE. Yes; I was pretty careful.

Mr. LAMB. So as not to cut the roots?

Master MOORE. Yes.

Mr. LEE. How many times did you plow the corn?

Master MOORE. I harrowed it about every week.

Mr. COCKS. Did you harrow the whole business with a big harrow, or did you harrow between rows?

Master MOORE. With a small harrow between rows.

The CHAIRMAN. Did you do all the work yourself?

Master MOORE. No, sir.

Mr. LAMB. We thought that you boys did all of the work yourselves.

Master MOORE. I had some help.

Mr. MARTIN. Let me explain that. He and his brother were both under the age that we required and he and his brother exchanged work. They are both boys and both in the club; but he and his brother exchanged work. They were both in the contest and both in the club. That was all, was it not?

Master MOORE. Yes.

Mr. MARTIN. You and your brother exchanged work?

Master MOORE. Yes.

The CHAIRMAN. Was other corn grown on the same place by ordinary methods?

Master MOORE. No, sir.

The CHAIRMAN. It was the only acre of corn that was grown on the place?

Master MOORE. Yes, sir.

Mr. MARTIN. His father is a Methodist minister, and it is parsonage ground out in the country. They have 4 acres of land, and I believe his brother rented some ground on the adjoining place.

Mr. COCKS. Was it white or yellow corn?

Master MOORE. White corn.

Mr. COCKS. What seed did you use?

Master MOORE. Batts's Prolific.

Mr. MARTIN. He got his seed from Mr. Batts. It is very prolific, and is much used in the South. There are two, three, and four ears to the stalk. This same corn made 226 bushels to the acre last year.

Mr. BEALL. What is the largest you got to any stalk?

Master MOORE. Four ears.

The CHAIRMAN. And what is the smallest number? Were there some stalks that had only one ear?

Master MOORE. Yes, sir. They would average about an ear and a half all over.

The CHAIRMAN. How tall were the stalks?

Master MOORE. About 8 feet high.

The CHAIRMAN. Do you know how long it was after the corn was planted before it was ready to gather?

Master MOORE. It was planted the last of March, and it was gathered the 25th of September.

The CHAIRMAN. In all of the work that you did in connection with this corn growing, you followed the instructions of the department, did you?

Master MOORE. No, sir. We bought the corn from Mr. Batts, and he sent the instructions. We went partly by them.

The CHAIRMAN. Did he instruct you in regard to the method of planting?

Master MOORE. Yes, sir.

The CHAIRMAN. And in regard to the application of the fertilizer?

Master MOORE. Yes, sir.

The CHAIRMAN. I believe you answered the question I am about to ask, but I did not hear your answer. Did you use the same kind of fertilizer all the way through?

Master MOORE. No, sir; it was mixed.

Mr. COCKS. What did you use besides the commercial fertilizer?

Master MOORE. I used stable manure and rich dirt.

Mr. COCKS. You used some nitrogen of some kind?

Master MOORE. Yes.

Mr. COCKS. What kind was it?

Mr. MARTIN. Nitrate of soda.

Mr. COCKS. What do you call it?

Master MOORE. Nitrate of soda.

Mr. COCKS. Did you use some Peruvian guano?

Master MOORE. No, sir.

Mr. COCKS. You said you used some guano. I did not know what you meant.

Mr. LAMB. They call it all guano.

Mr. COCKS. Did you cut this corn and husk it yourself?

Master MOORE. No, sir.

Mr. MARTIN. There was a committee to shuck it. You had a committee there, did you not?

Master MOORE. There was a committee there to shuck it

Mr. COCKS. You do not cut your corn down in that country, do you?

Master MOORE. No, sir.

The CHAIRMAN. The 228 bushels represents that much in weight of shelled corn, does it?

Master MOORE. Yes, sir.

Mr. LAMB. Forty barrels.

Mr. MARTIN. Did you not get some personal instructions from Mr. Gasque and Mr. Williams, our State agent, about the seed, and about planting, and did you not get circulars from the office?

Master MOORE. Yes, sir; I got instructions and circulars from them.

Mr. MARTIN. And you joined the club that Mr. Gasque organized?

Master MOORE. Yes, sir.

Mr. BEALL. Did you let that corn grow with only a space of 6 inches between stalks?

Master MOORE. Yes, sir.

Mr. BEALL. Did you water it?

Master MOORE. No, sir.

Mr. BEALL. You just depended upon the rain fall?

Master MOORE. Yes, sir.

Mr. LEVER. Did you have a good season, Jerry?

Master MOORE. Yes, sir; it was a good season.

Mr. LEVER. How much corn did your brother make on the land that he rented?

Master MOORE. 59.96 bushels. He couldn't use but \$10 worth of fertilizer.

The CHAIRMAN. How much did the fertilizer cost that you used on your acre?

Master MOORE. \$66 and something.

Mr. STANLEY. Why could he not use \$66 worth of fertilizer?

Master MOORE. He went into a prize contest that an agricultural paper had, too. He couldn't use over \$10 worth.

Mr. LEVER. The rules would not allow him to use over \$10 worth.

The CHAIRMAN. What was the average yield of corn in this neighborhood?

Mr. MARTIN. About 18 bushels, taking the average the State over—18.5. This would be an average neighborhood in South Carolina.

Mr. CHAPMAN. What kind of land was it? Was it upland or lowland?

Master MOORE. Sandy upland.

The CHAIRMAN. What was the name of the town and county?

Mr. MARTIN. Winona, Florence County. It is a small village.

Mr. HAWLEY. In counting up the cost of the corn per bushel, did you include the usual interest on the value of the land, taxes, etc.?

Mr. MARTIN. We had them charge themselves \$5 rental per acre, 10 cents an hour for their time, and 10 cents an hour for the time of their horses. We had them all keep books.

Mr. HAWLEY. You included all of the items that would go into a farmer's account?

Mr. MARTIN. Yes. You can rent land for less than \$5 an acre, but that was the general suggestion that we made to all of them, that they charge themselves \$5 rental in their bookkeeping. That would cover taxes and everything.

Mr. CHAPMAN. What part of Arkansas is the boy from who raised this—

Mr. MARTIN. This boy is from South Carolina.

Mr. CHAPMAN. I am talking about the boy from Arkansas.

Mr. MARTIN. He is from Silver, about 30 miles west of Hot Springs.

Mr. LAMB. What county is the Virginia boy from?

Mr. MARTIN. Dinwiddie County. His post office is Sutherland.

Mr. STANLEY. How many of these boys are ministers' sons?

Mr. MARTIN. Two of them. The father of one is a Methodist minister and the father of the other is a hard-shell Baptist.

Mr. HOWELL. What is the cost of raising corn in South Carolina?

Mr. MARTIN. I do not know that I can say. The farmers do not keep books, and there are no statistics covering that point. One of the important points that we are trying to impress upon the boys is the keeping of accounts, so that they will know what it does cost.

Mr. HOWELL. What was the cost per bushel of the 59 bushels per acre?

Master MOORE. Twenty-seven cents.

Mr. HOWELL. And your cost was what?

Master MOORE. Forty-three cents.

Mr. MARTIN. Mr. Batts sent out instructions along with the seed. We do not suggest that much fertilizer. There are certain general principles that we try to impress upon the boys about deep plowing, seed selection, and the economical use of fertilizer.

The CHAIRMAN. By whose advice did this young man use that enormous quantity of fertilizer?

Master MOORE. I got that advice from Mr. Batts.

Mr. MARTIN. Dr. Knapp does not stand for that. One of the other boys from the same State had a yield of 177 bushels at a cost of 23 cents.

Mr. STANLEY. I would suggest that this boy, Jerry Moore, could perhaps do a valuable service for the department (I do not know whether there is any provision of that kind made or not) by subsequently planting that acre with corn and not using fertilizer to see what effect the fertilizer has upon the ground. I would suggest that he might plant 2 acres, this acre and one adjoining, and see what the effect is next year.

The CHAIRMAN. I think it would be very interesting to have the same acre planted this year in the same way, but without having any fertilizer put on.

Mr. STANLEY. That is what I say; but I say that there should be an acre adjoining planted, because you could not get the value of your experiment without having corn growing upon the adjoining land.

The CHAIRMAN. Are you going to live at the same place this year?

Master MOORE. Yes, sir.

The CHAIRMAN. Have you any idea of trying to raise another acre of corn?

Master MOORE. I do not know.

The CHAIRMAN. If you can sell it at \$3 a bushel I should think it would be a pretty good investment. You heard what Mr. Stanley said. It would be interesting to see how much you could raise on that acre next year without any fertilizer, to see whether you could not diminish the cost of your product.

Mr. LEVER. What was the average cost of the land at that time per acre? What could you buy land for in that section per acre?

Mr. MARTIN. It has advanced a good deal in the last few years. I should say it would average \$50 to \$60 per acre.

The CHAIRMAN. Of course it is very interesting to hear from all these boys, but we have not the time to hear them all.

Mr. MARTIN. I would like to have you hear one or two, who are typical of others.

The CHAIRMAN. Very well.

STATEMENT OF MASTER STEPHEN HENRY, OF MELROSE, LA.

Mr. MARTIN. Stephen, how much did your corn cost?

Master HENRY. 13.6 cents.

The CHAIRMAN. What was your yield?

Master HENRY. 139.8 bushels.

The CHAIRMAN. Did you follow practically the method that has just been described?

Master HENRY. No, sir; I worked it nearly entirely by the Government method.

The CHAIRMAN. When did you plow the land?

Master HENRY. I fertilized it first, and then plowed it in the fall, and let it lay all winter that way, and broke it up again twice in the spring before planting.

The CHAIRMAN. You plowed it twice before you planted?

Master HENRY. Yes, sir.

The CHAIRMAN. How deep did you plow it?

Master HENRY. About 8 inches.

The CHAIRMAN. And then how did you plant the corn?

Master HENRY. I planted it in rows 4 feet wide and about 18 inches apart with the drill.

Mr. HOWELL. Did you have a subsoil plow?

Master HENRY. No, sir.

The CHAIRMAN. Did you leave one stalk in a hill?

Master HENRY. I left two stalks until it got a pretty good size, and then I cut the other out, so I was sure of having a stalk; and then I thinned it out to about 18 inches apart.

The CHAIRMAN. What was your cost for fertilizer?

Master HENRY. About \$8—\$6 or \$8.

The CHAIRMAN. Is that all?

Master HENRY. Yes, sir.

The CHAIRMAN. You used the ordinary commercial fertilizer?

Master HENRY. No sir; I used barnyard manure.

The CHAIRMAN. How did you arrive at the cost of that manure? Is there a market price for it there?

Master HENRY. No, sir; it said in the instructions that we were to allow \$2, I think, for a load of it.

Mr. MARTIN. We required them to charge up \$2 for a 2-horse load and \$1 for a 1-horse load.

Master HENRY. There is no market price for it. You can get all you want of it.

The CHAIRMAN. So as a matter of fact, all the manure cost you was the cost of your own labor in hauling it?

Master HENRY. Yes, sir.

Mr. HAWLEY. Was it well rotted, or was it just manure that had accumulated that year?

Master HENRY. It just accumulated that year; but when I plowed it under it was mixed with the soil.

The CHAIRMAN. You added manure during the growing season?

Master HENRY. No, sir.

The CHAIRMAN. You did not add any after the first spread?

Master HENRY. No, sir.

Mr. LAMB. How many loads did you put to an acre?

Master HENRY. Two.

Mr. HAWLEY. Did you scatter it by hand or with a manure spreader.

Master HENRY. With a spade.

Mr. LEE. What kind of soil was it?

Master HENRY. It was sandy soil—Red River bottom soil.

The CHAIRMAN. What was grown on the soil last year?

Master HENRY. Sorghum.

The CHAIRMAN. Was corn grown in the fields nearby?

Master HENRY. Yes, sir.

The CHAIRMAN. This year?

Master HENRY. Yes, sir.

The CHAIRMAN. What did it yield?

Master HENRY. It yielded about from 15 to 30 bushels.

The CHAIRMAN. And yours was how much?

Master HENRY. One hundred and forty-eight.

The CHAIRMAN. Do you think that the increase in your yield was due to the fertilizer?

Master HENRY. No, sir. It was due to cultivation by the scientific methods of cultivation.

The CHAIRMAN. You think it was due more to the cultivation than to anything else?

Master HENRY. Yes, sir.

The CHAIRMAN. Due more to that than to the way it was planted?

Master HENRY. No, sir; that didn't matter. A lot of it after it got big was killed down. The frost killed it down. I could have averaged 175 bushels. About 15 per cent was killed by the frost.

Mr. HAWLEY. What did you do in the way of cultivating the land after planting?

Master HENRY. I cultivated it mostly with a shallow cultivator, so as not to injure the roots.

The CHAIRMAN. Did you spend any more time cultivating it that way than you would have spent cultivating corn in the ordinary fashion?

Master HENRY. Yes, sir; I cultivated about six times. The average down there is about four times. I cultivated about six times.

Mr. HAWLEY. What kind of corn did you raise?

Master HENRY. Gandy's Prolific.

The CHAIRMAN. What did you say your cost per acre was?

Master HENRY. 13.6 cents per bushel.

The CHAIRMAN. I mean per bushel. How much more would you say that was than the average cost of a bushel?

Master HENRY. Well, the other way they do not make but about 15 to 30 bushels. It would cost the same the other way, because they make so little; and yet they work it. I worked mine just about two times more than they did.

The CHAIRMAN. So that even if they should produce as much on the acre as you do under your method, they would only produce it a very few cents cheaper?

Master HENRY. Yes, sir. They could not produce it at less than 10 cents a bushel, even if they made the yield that I made.

Mr. HOWELL. Has the land that you used been fertilized in previous years?

Master HENRY. No, sir; it was very poor and had what we called guinea grass on it—Johnson grass.

Mr. HOWELL. So that the land which raised 15 and 20 bushels per acre is twice as good land as the land you used?

Master HENRY. That is all the same.

Mr. HAWLEY. Are you a farmer's boy?

Master HENRY. Yes, sir.

Mr. BEALL. You sell this corn for seed, do you?

Master HENRY. Not yet. I will later. I have a lot of orders.

Mr. LAMB. How old are you?

Master HENRY. Sixteen.

Mr. BEALL. What do you get for it, a bushel?

Master HENRY. From \$2 to \$3.50.

The CHAIRMAN. This is all very interesting.

Mr. LEE. Call the Georgia boy, Mr. Martin.

Mr. BEALL. Or the Arkansas boy.

STATEMENT OF MASTER JOE STONE, JACKSON COUNTY, GA.

Mr. LEE. What county are you from?

Master STONE. Jackson.

The CHAIRMAN. Shall I ask him about the same questions?

Mr. LEE. Yes; ask him just a few questions.

The CHAIRMAN. When did you apply the manure to your land, Joe?

Master STONE. In March.

The CHAIRMAN. Did you apply it before you had plowed or after?

Master STONE. I plowed it before.

Mr. RUCKER. The fertilizer, you mean.

The CHAIRMAN. Yes.

Master STONE. No, sir; I broke it up with a two-horse plow, and put six loads of stable manure on it, and cut it up with a harrow. I laid the rows off 4½ feet wide and then subsoiled it and dropped the seed in there 14 inches apart, in the drill.

Mr. LEE. You did not plow the land in the fall?

Master STONE. No, sir.

The CHAIRMAN. Is that all, Mr. Lee?

Mr. LEE. That is about all.

Mr. LEVER. You cultivated it yourself?

Master STONE. Yes, sir.

Mr. LEE. What kind of corn did you raise?

Master STONE. Hasting's Prolific.

Mr. HOWELL. In your cultivation you followed the instructions of the Department of Agriculture, did you?

Master STONE. Yes, sir.

Mr. LAMB. And you did all the work yourself?

Master STONE. Yes, sir.

Mr. HAWLEY. Are you a farmer's boy?

Master STONE. Yes, sir.

Mr. LAMB. How old are you?

Master STONE. Eleven.

Mr. HAWLEY. What is your yield per acre?

Master STONE. One hundred and two and five-eighth bushels.

Mr. HAWLEY. What did it cost per bushel?

Master STONE. Twenty-nine cents.

Mr. LAMB. Did you keep the books and records yourself? Did you keep your accounts?

Master STONE. Yes, sir.

Mr. HAWLEY. What did the farmers around through there raise on their fields?

Master STONE. My brother raised 94½.

Mr. HAWLEY. I mean the farmers who were not in the contest.

Master STONE. They did not make as much as my brother.

Mr. LEVER. How many bushels did your father raise in his crop?

Master STONE. He was not in it. Just me and my brother.

The CHAIRMAN. But we want to know what the average yield was in the neighborhood there?

Mr. LEE. How much does the average farmer make per acre, Mr. Stone?

Mr. STONE. About 18 or 20 bushels.

Mr. LEVER. How much did you make, Mr. Stone?

Mr. STONE. About 20.

The CHAIRMAN. Do you think you will do any better next year?

Mr. STONE. I will know how another year. [Laughter.]

Mr. LAMB. Did you work yours in the way he worked his?

Mr. STONE. No, sir; I never did anything to the land, only to pull out some stumps.

Mr. LEVER. Will you work your farm next year on the plan of the boys?

Mr. STONE. Yes, sir.

Mr. HAWLEY. Have you any more at home like him?

Mr. STONE. He and his brother had the 2 acres, and they worked two and two together, following the rules.

The CHAIRMAN. I would like to ask Mr. Stone—I am glad he is here—following up the question asked by Mr. Lever, whether the contest and the results of it have attracted general attention in the county, and whether in his judgment it will result in introducing better seed and better methods.

Mr. STONE. Oh, yes, sir; a whole lot. There are about four of these boys' clubs. They are in several places there. They have had large yields in all those places. In fact, some of the boys, I think, beat my boy; but the cost was more. He had a lower cost to raise

the same corn on the same land. Some of the boys beat him in their yields.

Mr. LEVER. Did any of your neighbors come to see the corn?

Mr. STONE. Yes, sir; lots of them came. Some of the old soldiers came and looked at it and said it beat any corn they had ever seen grown in Georgia.

Mr. LEVER. The land was fertilized after the corn was planted?

Mr. STONE. Yes, while the crop was growing. He applied the fertilizer while the crop was growing. That made him more corn than at any other time—while the crop was growing.

Mr. MARTIN. I might say that a movement has been started in Atlanta to raise \$3,000 to give this boy a farm. They started a subscription. Mr. Stone has been living on rented land. They propose to give this boy a farm.

The CHAIRMAN. If they turn him loose he will not need it as a gift. He will be able to buy his own farm.

Mr. LEE. Mr. Stone, how many ears are there to a stalk of Hastings Prolific?

Mr. STONE. Five ears, it will average. Some stalks have as much as nine.

The CHAIRMAN. Let me see if I understand that aright. They average five ears to the stalk?

Mr. STONE. Yes, sir. The committee that pulled it did not find a single stalk that did not have any ear, and very few that did not have two.

The CHAIRMAN. And they run as high as nine?

Mr. STONE. Yes, sir. We sent some to the State Agricultural Department that had nine.

The CHAIRMAN. Were they fairly large?

Mr. STONE. A good size for that variety of corn.

Mr. McLAUGHLIN. What was your method of applying the fertilizer when the corn was growing?

Mr. STONE. He did not do it until the seed began to grow. Then he put the guano on one side, and waited 10 days and put on another lot, and scattered it with his hand, right along in the furrow, and then harrowed it in. He put in 75 pounds of nitrate of soda.

Mr. HAWLEY. Does this corn sell as well in the general market as the other varieties?

Mr. STONE. Yes, sir; it is good grain corn.

Mr. HAWLEY. It is considered just as good as any other for food and stock.

Mr. STONE. Yes; but it would be better to make corn bread.

The CHAIRMAN. What did you pay for the seed?

Mr. STONE. Four dollars a bushel.

Mr. STANLEY. Was this new land?

Mr. STONE. It has been used several years.

Mr. BEALL. This corn has a small grain?

Mr. STONE. Yes, sir; very small. The cob is not much thicker than my little finger.

Mr. STANLEY. How long is the ear?

Mr. STONE. About 7 inches on the average.

Mr. HOWELL. It has just as much value on the market as any other corn?

Mr. STONE. Yes, sir. It is absolutely sound. There is no rotten corn in it at all.

Mr. STANLEY. Does the ear grow close to the stalk, or out on the end of the stalk?

Mr. STONE. On the end.

Mr. MARTIN. Somebody wanted to hear a few words from the Arkansas boy. This is Ira Smith, of Silver, Ark., 30 miles west of Hot Springs.

STATEMENT OF MASTER IRA SMITH, OF SILVER, ARK.

The CHAIRMAN. You heard the questions that we asked the other boys. What we would like to know is when and how you plowed your land, how much fertilizer you used, or manure, when you put it on, and your method of culture. But I will ask you one question at a time. How much fertilizer did you use and what kind?

Master SMITH. Three hundred pounds—blood and bone and phosphoric acid.

The CHAIRMAN. When did you apply it?

Master SMITH. I put two applications on, one when it was planted, and one when it was about a month old.

The CHAIRMAN. When did you plow the ground—in the fall or in the spring?

Mr. LEVER. When did you break it up—in the fall?

Master SMITH. Yes, sir.

The CHAIRMAN. Did you break it up again in the spring?

Master SMITH. No, sir; I disked it in.

The CHAIRMAN. How far apart were the rows?

Master SMITH. Three and a half feet.

The CHAIRMAN. How close were the stalks?

Master SMITH. Thirteen inches.

Mr. LAMB. One stalk in a hill?

Master SMITH. Yes, sir.

Mr. LEE. What kind of corn did you use?

Master SMITH. St. Charles and Gourd seed.

The CHAIRMAN. Did you cultivate it with a plow or a harrow?

Master SMITH. I first harrowed it three times and plowed it with a cultivator twice.

The CHAIRMAN. Did you cultivate with a hoe at any time?

Master SMITH. No, sir.

The CHAIRMAN. You did not use a hoe to cut out weeds between the stalks?

Master SMITH. No, sir.

Mr. COCKS. Did you pull out the weeds by hand?

Master SMITH. No, sir.

Mr. COCKS. There were no weeds in it?

Master SMITH. No, sir.

The CHAIRMAN. What crop was in the ground the year before?

Master SMITH. Corn.

Mr. HAWLEY. How many bushels did you get per acre?

Master SMITH. One hundred and twenty.

Mr. HAWLEY. What did it cost you per bushel?

Master SMITH. About 8 cents a bushel.

Mr. HAWLEY. What did your neighbors who raised corn raise per acre? What number of bushels per acre did they raise?

Master SMITH. About 20 to 35.

The CHAIRMAN. And did they cultivate it as many times as you did yours?

Master SMITH. No, sir.

Mr. HAWLEY. Did they put any fertilizer on their ground?

Master SMITH. No, sir.

The CHAIRMAN. Was it upland or bottom land?

Master SMITH. It was a kind of bottom land.

Mr. CHAPMAN. What county in Arkansas is it?

Master SMITH. Montgomery County.

Mr. LAMB. How old are you?

Master SMITH. Twelve.

Mr. BEALL. Is this your first year in raising corn?

Master SMITH. Yes, sir.

Mr. BEALL. Are you going to try it again next year?

Master SMITH. Yes, sir.

Mr. LEVER. How much did your father make on his ground per acre?

Master SMITH. About 15 to 35.

Mr. LEVER. Is he going to follow your plan next year, do you think?

Master SMITH. I do not know.

Mr. HOWELL. Did you have better land than the average land around you?

Master SMITH. No, sir; it is all just about alike.

Mr. McLAUGHLIN. What prize did you get?

Master SMITH. The first prize.

Mr. McLAUGHLIN. What was it?

Master SMITH. A disk harrow and planter.

Mr. McLAUGHLIN. Who gave the prize?

Master SMITH. The John Deer Plow Co.

Mr. STANLEY. Would it not be a good idea to put a little appropriation in one of these bills for a test? It looks to me like two phases of this experiment ought to be valuable, in order to get the greatest practical benefit to the farmer. One is the increased fertility of the soil and the other is the effect upon the soil of this artificial fertilizer. I was told when I was down in Mr. Lamb's country, in going through Virginia, that they fertilize their tobacco there all the time. The great majority of the farmers in my country never use an ounce of fertilizer. They say that where the land has been fertilized for 10 or 20 years, say, it would form a crust on the surface of the land that would materially impair its value when you attempt to cultivate without fertilizer. The use of this excessive fertilizer might be that it would remain in the land and add to the fertility for a number of years to come. It may be that it would be followed by effects that were detrimental; and I think it would be very wise to have some notice taken of these acres of land that have been excessively fertilized by subsequent cultivation without any added fertilizer.

The CHAIRMAN. What you say undoubtedly suggests some very interesting problems, but I suspect that it would be better to take that matter up with the bureau chiefs at a later time.

Mr. STANLEY. I make this suggestion to the boys, so as not to have them lose sight of their acre of land.

Mr. HAWLEY. I would like to suggest to the gentleman who is at the head of the delegation that as we have only asked four or five boys questions he might prepare answers for all of the boys to the questions that we have asked, so that we could have the information as to all of the country where the corn was raised, and we could insert it in the record.

Mr. MARTIN. I will do so with pleasure.

Hughey Harden, Alabama.—Broke land 12 to 14 inches in the fall; harrowed twice. Laid off furrows very deep, put some fertilizer in drill. Used 3 tons of stable manure and 600 pounds of commercial fertilizer. Rows 3 feet apart. Harrowed corn when first came up, barred off rows when corn was few inches high. Used 1,000 pounds fertilizer as side dressing. Land is sandy with clay subsoil.

Ira Smith, Arkansas.—Broke land early in the season as deep as mules could pull. Used \$3 worth of blood, bone, and cotton-seed meal. Planted $3\frac{1}{2}$ feet in row and 13 inches in drill. Used harrow twice and cultivator three times after corn came up.

Joe Stone, Georgia.—Used 2-horse plow and broke land 12 inches deep and subsoiled in early spring. Threw broadcast 6 loads of manure; broke land second time and harrowed it. Rows $4\frac{1}{2}$ feet apart and 14 inches in drill. Put 2 sacks fertilizer in drill. Used 400 pounds guano and 75 pounds nitrate of soda. Cultivated shallow. Used weeder, harrow, and sweep. Five cultivations; used prolific corn.

Stephen G. Henry, Louisiana.—Broke land early in December 8 inches deep and subsoiled. Pulverized soil thoroughly and planted corn March 17. Four feet in row, 18 inches in drill. Used 2 tons stable manure. Severe frost did considerable damage. Replanted corn; cultivated six times with harrow and cultivator. Planted peas between rows of corn at last cultivation. Used prolific corn.

William Williams, Mississippi.—Selected acre in fall that had been in oats and peas. Prepared soil about 1 foot deep. Got land in fine condition. Used prolific corn; planted it 4 feet in row and 15 inches in drill. Used two loads stable manure, 500 pounds cotton-seed meal. Cultivated shallow and flat six times. Had severe frost and freeze. Too much rain in May. Corn near by "fired" in dry weather; his crop remained green. Made several bushels peas on the same land. Selected 200 of his best ears from the field for next year's crop.

William Ernest Starnes, North Carolina.—Joined corn club last year; selected acre which had been in clover; made 63 bushels. Selected acre this year following rye. Hauled out 15 loads of poultry and barnyard manure. Plowed soil 8 to 10 inches in fall. Ran disk harrow over it in March. Broke land again in April. Harrowed it and rolled it. Used 400 pounds lime and 400 pounds acid phosphate broadcast. Planted corn 44 inches in row. Used the weeder once a week until corn was too large, then used riding cultivator. Planted corn thick and thinned it out to 12 inches. Had hard rains, which washed some corn and soil away. Used 200 pounds acid as top dressing.

Floyd Gayer, Oklahoma.—Broke land in November 12 inches deep. Harrowed land thoroughly, planted it in rows 3 feet apart and 14 inches in the drill. Cultivated it on the level; used harrow and cultivator very freely. Cultivated it seven times; worked late in season in order to hold moisture. Had very dry weather. Carried water and put it on corn to keep it from suffering.

Jerry H. Moore, South Carolina.—Acre had been planted in cotton the year before. Old land nearly level. Broke land early in spring 10 to 12 inches deep. Harrowed it thoroughly and laid off rows $3\frac{1}{2}$ feet wide; corn planted about 6 inches in the drill. Used prolific corn; used \$66.55 worth of commercial fertilizer, part at planting time but most of it as side dressing; also used 50 one-horse loads of stable manure. Had previously put 300 one-horse loads of pine mold and rich dirt in stable and on land. Barred off rows when corn was small, afterwards used harrow lightly. Had distributed fertilizer in rows, but got farther and farther from corn each time; finally put it in middles. Harrowed corn at 11 different times. Had about 24,000 stalks; nearly every stalk had 1 ear, most of them 2 or 3, and some had 4.

Maurice Olgers, Virginia.—Broke land early in spring 12 to 15 inches deep. Acre had been in tobacco year before. Prepared soil thoroughly. Planted June 1st $3\frac{1}{2}$ feet in the row and 10 inches in the drill. Used 500 pounds of bone meal. Cultivated flat and shallow five times. Planted white corn which averaged two ears to the stalk.

Archie Odom, South Carolina.—Land dark sandy loam, top soil 8 inches, loose loamy clay beneath. Acre had been in cotton. Broke land in February about 15 inches

deep. Rows 3 feet 9 inches. Corn 6 or 7 inches apart in drill. Used prolific corn, which had been developed several years in neighborhood. Got good stand. Used \$39.85 worth of fertilizer at different times. Ploughed near corn in May and put in fertilizer. Early in June used sweep and put 800 pounds fertilizer on each side of corn. Used 600 pounds nitrate of soda. Cultivated corn with plow and harrow. Did not use hoe.

John Williams, Alabama.—Broke and subsoiled land about 10 inches deep in November. Harrowed five or six times during winter. Rows 4 feet, corn 10 inches in drill. Four years ago corn produced 10 to 15 bushels per acre; has been built up by deep plowing and rotation of crops. Soil is now 10 or 12 inches deep. Used \$20 worth of stable manure and \$10.50 worth of fertilizer. Applied nitrate of soda in June. Harrowed corn frequently.

Mr. BEALL. Where is the Texas boy?

Mr. MARTIN. He did not come. He is about 14 years of age, and his father was a little unwilling to have him come. He imagined that it was colder here than in southern Texas. The diploma was awarded to him all right, but he did not come.

Mr. STANLEY. I would suggest—I think it could be done, Mr. Chairman—that it would be interesting for each one of these boys who have been before the committee to get a copy of these hearings, or several copies. Mr. Martin might leave a memorandum of their names and addresses.

Mr. BEALL. I think this would be a very good opportunity for the chairman to make a speech.

The CHAIRMAN. The gentleman from Texas has a rare appreciation of the "psychological moment." Young gentlemen, the committee would be delighted, as I think you know, to hear a report from each one of you in regard to the work you have done in this contest; but that would take more time than we can spare this morning. I certainly wish, on behalf of the committee, to express to you the satisfaction we have in your visit and the interest we have taken in it, and in the work you have been doing. I think I may also speak for the committee in congratulating you, partly upon your success, because it is always good to win, but chiefly on the ambition which prompted you to enter the contest, on the training and the experience the contest must have given you, and the incentive to further effort which it seems to me must necessarily be inspired by your experience in this contest.

I think also that you may be congratulated not only upon the incentive which will spring up in your own minds, but upon the incentive which your experience will give to your neighbors—not to your immediate neighbors only, but to your neighbors in the very widest sense. I know that before I came away from home this fall a farmer in my own neighborhood came into my office and wanted to know if there was any literature available which would describe the methods that had been used by the boys in your own southern contest; showing the very widespread interest, the nation wide interest, that has been taken in the work you have been doing.

Somebody has said, I believe, that he who made two blades of grass to grow where one grew before was a benefactor of the race, and surely a man or a boy who can make from two to ten bushels of corn grow where only one has grown before is entitled to the good wishes and the high regard of his countrymen.

I remember very well as a boy on the farm how tired I used to get of the political orators and the other statesmen who came around on the

Fourth of July and on other occasions telling us what a fine independent life the farmer lived, how he was the bone and sinew of the land, and had chosen the noblest occupation of them all. The only thing that I believed about all they said was the "bone and sinew" part, and I thought that that was due to the fact that the work was so hard and the living so poor that there was nothing left of us but bone and sinew. [Laughter.] But that was in the time—at least it was in the place—when to be a farmer was to be isolated from your neighbors, to be out of the currents of the life of the country, to be without facilities for schooling your children, to be, as I think somebody has said, "a companion to the clod and a brother to the ox." But those days have changed now. With the extension of the telephone a farmer can hear the voice of his neighbor at any moment. With the extension of the Rural Delivery Service he can keep in just as intelligent touch with the affairs of the world as can his town brother; and with the extension of scientific knowledge which the Department of Agriculture has done so much to acquire and to disseminate, the time has come when the farmer can look upon his soil as a laboratory in which he can carry out experiments and demonstrate methods and theories that ought to and must interest him just as much as the experiments and demonstrations which the scientist carries out in the laboratory which he uses.

All of these things make the life of a farmer in these days vastly more attractive than it was 30, 40, or 50 years ago; and I feel sure that you young gentlemen, having the introduction so early as you have had, to what can really be accomplished by intelligent effort, directed along the right lines, will realize that it is not so bad a lot to be a farmer after all. We hope you have enjoyed your visit in Washington, we trust you will have a safe return to your homes, and that happiness and prosperity may follow you all the days of your life. [Applause.]

Mr. RUCKER. Before we adjourn, in view of the wonderful success that has come to these efforts in the South, I move that the Agricultural Department move away from South Carolina and come back to Washington. [Laughter.]

(The committee thereupon adjourned.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 16, 1910.

The committee met at 10.30 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

STATEMENT OF MR. VICTOR H. OLMSTED, CHIEF OF THE BUREAU OF STATISTICS.

The CHAIRMAN. We are to consider the estimates for the Bureau of Statistics this morning, and I have asked the chief of that bureau, Dr. Olmsted, to be present, first, to make any general statement that he would like to present to the committee touching the work of the bureau, and afterwards give such information as we may need in order to fully understand the details of the estimates.

Mr. OLMSTED. It is difficult for me to make any general statement other than that I have made in my annual report, which is brief, being pretty well boiled down. Probably more or less time would be saved if I should simply read that—it will take but half a minute—rather than to undertake to make an extemporaneous statement.

The CHAIRMAN. Very well.

Mr. OLMSTED. The report says that the bureau pursued the same lines of work and followed the same general methods as characterized its operations during preceding years; that the bureau made as much progress as was possible and at the same time keep expenditures within the limits of the appropriation. During the fiscal year 1910 the following changes were made in the monthly crop reports of the bureau: On September 1, 1909, for the first time an inquiry was made concerning the quantity of barley of the preceding year's growth on farms September 1. In the November schedule the average weight of a measured bushel of wheat, of corn, of oats, and of barley was asked, these questions hitherto having been asked in December, except that the weight of barley was reported for the first time. In November, also, inquiry was made for the first time as to the quality of apples.

Inquiry relating to the production of rice was made in the December schedule, instead of in November as previously, and the acreage of rice harvested was also asked for the first time in December. These different points indicate that we are getting more and more information of interest pertaining to agriculture as rapidly as we can do so, and getting our clerks up to the point of handling it. Commencing with February, 1910, there was inaugurated a special monthly schedule of inquiry concerning the monthly prices of numerous farm products, including rice, clover seed, tobacco, sweet potatoes, cabbages, onions, beans, apples, peaches, pears, quinces, cranberries, broom corn, oranges, lemons, hops, peanuts, wool, milk, honey, milch cows, veal calves, beef cattle, sheep, lambs, hogs, horses, and cost to

farmers of bran and cotton seed, in addition to continuing the regular monthly inquiries concerning the prices of the staple products such as corn, wheat, oats, barley, rye, buckwheat, potatoes, flax, hay, eggs, butter, and poultry. In March, for the first time, the stocks of barley on farms March 1 was asked, also the percentage of the barley crop shipped out of the county where grown. That corresponds to similar inquiries heretofore made in regard to wheat and corn. In April, 1910, the schedule included for the first time an inquiry concerning the mortality of spring lambs from disease and exposure. Then the report goes on and specifies all the subjects dealt with each month. I do not know that that will be of interest, because I have stated all of that before in previous reports.

The CHAIRMAN. It will hardly be necessary to put it in the record.

Mr. OLMSTED. I think not. The following special crop inquiries were made during the year: Stocks of potatoes in hands of growers and in hands of dealers on January 1, 1910; result published in the February crop reporter. Causes and extent of deterioration of normal production of various crops; results not yet published. Here is a very important inquiry and one that is going to be of much interest when the results are fully published. We have found that it is a very interesting and instructive inquiry.

The CHAIRMAN. Is that an inquiry that the Bureau of Statistics is best qualified to make?

Mr. OLMSTED. Yes, sir, in a statistical way; we shall ascertain the proportion of the deterioration attributable to each cause injuriously affecting each crop. It is entirely statistical and numerical; it is not the scientific nature of each cause of deterioration, but the proportion and the extent of the deterioration, due to each cause, from a numerical and statistical point of view, that will be learned. It will prove to be mostly valuable and of great service to specialists along those lines.

Mr. LEVER. How has it proven valuable?

Mr. OLMSTED. It shows, for instance, to what extent the deterioration was due to a flood, if there were floods in a certain area. In the December Crop Reporter you will see the result and the way we present it statistically in relation to the cotton crop. I think you will find it very interesting as far as cotton is concerned.

Another special inquiry embraced monthly marketings by farmers of wheat, corn, oats, barley, flax, and hay; the results published in the January Crop Reporter.

The titles of some special articles prepared for the Crop Reporter (the official monthly publication of the bureau) were: "Total values in 1908 of crops reported quantitatively, compared with values in 1899, by States," published in the August Crop Reporter. We carried it back to 10 years, which was never done before in that particular form. "Yield per acre, by decades, of wheat, oats, barley, and rye in various countries." That was published in the September Crop Reporter. "Production and consumption of manufactured fertilizers." That was published in the October Crop Reporter. "Statistics of mortality among farmers," published in the November Crop Reporter. "Per capita production of farm products, by decades." That was a very important subject, and one which had not been dealt with previously, and it was published in the November Crop Reporter. "Wheat prices in England in six centuries, averages by decades."

That was published in the November Crop Reporter. "Meaning of normal in estimates of crop condition," published in the December Crop Reporter. "World's supply of live stock," published in the February Crop Reporter. "Percentages of total land area in various crops in different decades, by States, and for given years, by various foreign countries," published in the April Crop Reporter. This was not the volume of the crops, but the amount of land devoted to those crops in the different States. "Total value in 1909 of crops reported quantitatively, compared with values in 1908 and 1899, by States," published in the May Crop Reporter.

During the year investigations in regard to acreage and production of tobacco have progressed so favorably that the bureau is now making estimates annually of the total acreage and production of tobacco by types.

A new feature inaugurated during the year has been the publication in the Crop Reporter of charts which show graphically the relative condition of crops in the different States of the United States. So that the mind is appealed through the eye, instead of through columns of figures.

Those are some of the things we did in spite of the fact that we had no increase in our appropriation; by simply working our clerks that much harder we accomplished them.

The CHAIRMAN. I would like to inquire in regard to the statistics which you gathered upon the prices of various commodities. What market did you use as a basis?

Mr. OLMSTED. We did not use a market. We secured information as to prices from the farmers themselves; they are the prices the farmers received—the farm prices, not the market prices. They are published in the Crop Reporter by stating the average for each State, showing the average prices received by the farmers in that State for each particular product. We also published the market prices gathered from the principal markets in the Crop Reporter, but that is a different presentation from the one about which I was speaking.

The CHAIRMAN. You obtain these figures from your regular corps of correspondents?

Mr. OLMSTED. Yes, sir; all of these figures we obtain from voluntary correspondents, farmers throughout the whole country, thousands of them.

The CHAIRMAN. I presume your organization is practically the same as it always has been?

Mr. OLMSTED. The organization is just the same as it was last year and the year before. We have not had an opportunity to change the plan of organization.

Mr. LEVER. About how many Crop Reporters do you distribute?

Mr. OLMSTED. About 160,000. We could very readily increase the number if the Chief of the Division of Publications was willing to bear the expense.

Mr. LEVER. Is there any special demand by the farmers for the Crop Reporter?

Mr. OLMSTED. We receive demands all the time; every rail brings scores of demands. You understand we send the Crop Reporter to our correspondents, in addition to others who make specific request for it.

Mr. LEVER. Just how is the Crop Reporter valuable to the farmers? It always comes a month late.

Mr. OLMSTED. Pardon me; it is issued only a few days late, each month. We issue our estimates early in the month, and within a few days afterwards—just as quickly as the Government Printing Office accomplishes the work—they are printed in the Crop Reporter.

Mr. LEVER. In order to get to the farmers the estimates of the department on the various crop conditions?

Mr. OLMSTED. Yes, sir; the Crop Reporter, however, contains other information. We give information as to prices; we give statistics of various sorts of interest to the farmer, of interest to the dealer and the consumer.

Mr. LEVER. What does it cost to print the Crop Reporter?

Mr. OLMSTED. That is a question I can not answer. The Bureau of Statistics does not pay for it; that printing is done at the Government Printing Office, through the Division of Publications, and I have nothing to do with it.

Mr. LEVER. Have you ever figured on the possibility of making it a weekly publication?

Mr. OLMSTED. I think you and I talked about this at one time, as I remember it. We would not have at this time the data from which to furnish material for a weekly publication; if we attempted to issue a publication more frequently than once a month we would not have the material to put in it. But sufficient material and data can be secured; it is merely a question of dollars, a question of money.

The CHAIRMAN. Do you maintain a permanent mailing list?

Mr. OLMSTED. Yes, sir.

The CHAIRMAN. A list of persons to whom you send this Crop Reporter?

Mr. OLMSTED. Yes. We send it to our correspondents, of whom we have upward of 140,000, and to such other people who desire it.

The CHAIRMAN. Do you send it regularly, without charge, to individuals who write and ask to have their names put on the list?

Mr. OLMSTED. Yes, sir; anyone who wants it can have it, the same as any other public document.

Mr. LEVER. I had in mind this idea, that you could collect statistics from two or three towns in each State as to the condition of the crops, and that the condition of the crops, the range of prices, and so forth, could be published in the form of a weekly Crop Reporter. However, I presume it would cost a great deal of money?

Mr. OLMSTED. It would cost considerable money.

Mr. LEVER. Would it be valuable?

Mr. OLMSTED. That would remain to be seen, but I should think it would; if the Crop Reporter is valuable monthly it would be much more valuable, it seems to me, if it were published weekly. It seems to me, at first blush, it would be very valuable.

Mr. LEVER. You have no idea as to what such a publication would cost?

Mr. OLMSTED. No. As I remember it, you and I estimated it would cost about \$60,000 additional to what we now have; the cost of printing would be in addition to that, of course, and as to that I am not prepared to speak.

Mr. LEVER. It would cost considerably over \$100,000?

Mr. OLMSTED. I should judge it would, in addition to what we now have.

The CHAIRMAN. Have you had occasion to give much attention to the work of the international bureau of agriculture?

Mr. OLMSTED. Well, in a way, I have been compelled, and have been glad, to pay attention to it. I am designated as the person through whom communications shall flow back and forth between the Department of Agriculture and the Institute.

The CHAIRMAN. I presume you read the literature it publishes?

Mr. OLMSTED. I do.

The CHAIRMAN. And are familiar with what it is going to do and what it is actually doing?

Mr. OLMSTED. Yes, sir.

The CHAIRMAN. What is your view as to the present or ultimate value of it?

Mr. OLMSTED. Well, as to its present value I can not speak in terms of great praise, because the work is in a formative period; they have not yet sufficiently developed it to make it of any great international value, but if their plans as now laid out are carried forward, and they can secure prompt information from all the countries which contribute to that institution, there is no reason why it should not be of immense value in the future. It is, of necessity, a thing of growth. They can not perfect it in a day or a year; it is going to take several years to develop it so it will reach its greatest ultimate usefulness.

The CHAIRMAN. Your report speaks of the publication of statistics showing the crop yields of the principal countries throughout the world. How do you get that information generally?

Mr. OLMSTED. We get it from the official reports of the countries which issue official reports. We have those on file as rapidly as they are issued. When we can not obtain it officially we derive it from the best available commercial sources. We secure it from every dependable source we can.

The CHAIRMAN. How early are you able to get it? For example, the wheat crop of 1910; have you secured what you regard as reliable figures?

Mr. OLMSTED. Not generally. We published what we had to say in the last Crop Reporter. We have shown that the wheat crop this year is probably as great, or very nearly as great, as it was last year. The final figures have not yet been ascertained. However, the figures we have are sufficient to indicate an abundant wheat crop for the whole world.

The CHAIRMAN. What country leads in the production of wheat?

Mr. OLMSTED. Outside of the United States, you mean?

The CHAIRMAN. Yes.

Mr. OLMSTED. Russia.

The CHAIRMAN. What country outside of the United States leads in the production of corn?

Mr. OLMSTED. I could not tell you offhand; I would have to look up the statistics. There is no country that is a large producer of corn when you compare it with the United States. The United States is far ahead of all other countries.

The CHAIRMAN. I presume, as a matter of fact, it would probably be one of the South American countries.

Mr. OLMSTED. Yes, sir; but I do not remember which one has the greatest production—but none of them are producers at all in comparison with the United States.

The CHAIRMAN. If you have nothing further in the way of a general statement, we would like to direct your attention to the details of the estimates. I notice an increase of \$1,000 is submitted in the salary of the chief of the bureau, and unless you have something that you would particularly like to submit on that proposition we will pass it over until the Secretary comes before us, following the custom of the committee.

Mr. OLMSTED. I most certainly have nothing to say in antagonism of it.

The CHAIRMAN. What have you to say in support of the recommendation of an increase of \$250 in the salary of the assistant statistician?

Mr. OLMSTED. The assistant statistician is a man who must be of very great efficiency and of fine training and judgment. The position he fills is one of great responsibility, and I am using him now for the purpose of traveling through the country examining, instructing, criticising, and reporting upon the work of our special field agents and State agents. No man can do that who is not thoroughly familiar, in all details, with the work of our bureau; he must have grown up in it, almost; he must have become thoroughly inoculated with the methods, manners, and ideas governing the collection and compilation and publication of agricultural statistics, handled in the way we handle them.

The CHAIRMAN. Who holds that position?

Mr. OLMSTED. Dr. Jones holds the position now, and he is a very able and efficient man.

The CHAIRMAN. How long has he been in the bureau?

Mr. OLMSTED. He was appointed while I was taking the census of Cuba; he has been there about four years, I think; he was transferred to us from the Navy Department to the position of chief clerk, and promoted to this position when Dr. Clark was given the position of chief clerk of the Department of Agriculture. It is fully deserved by him; and fully earned by any competent man holding that position.

Mr. LEVER. Does he get the salary that Dr. Clark received?

Mr. OLMSTED. When Dr. Clark held the position of assistant statistician the salary was \$2,500, but Dr. Clark was promoted to be associate statistician at \$3,000.

The CHAIRMAN. That place has been dropped?

Mr. OLMSTED. That place is now filled again; I had to fill it because I have to use this man in the field; I must have two assistants, and must have one of them in Washington; I find our work increasing so rapidly that I had to have this additional help, an associate statistician with me in Washington to aid us in disposing of the increased volume of work now handled, and so that if one of us goes away temporarily the other will be here; but we are usually here, working together.

The CHAIRMAN. Who is he?

Mr. OLMSTED. Mr. Nat C. Murray, formerly assistant statistician. He is a very able man, one of the ablest men I have ever been associated with or have known in official life.

The CHAIRMAN. He was promoted and transferred to the lump sum?

Mr. OLMSTED. Yes, sir. There being no statutory position of associate statistician it was necessary to transfer him to the lump sum; the associate statistician has always been carried on the miscellaneous roll.

The CHAIRMAN. Do you regard the associate statistician as a scientist within the meaning of the statute, which required all employees below the grade of scientist to be transferred to the statutory roll? The last appropriation act, you will remember, contained language requiring the Secretary of Agriculture to present detailed estimates for all executive officers, and employees below the grade of clerk. Do you regard your associate statistician as a scientist?

Mr. OLMSTED. Most assuredly; he is a scientific statistician; and statistics is a science. He is one of the best equipped statisticians I know of—the best trained and the most efficient.

The CHAIRMAN. Who is filling the place which you designate on page 73, under the head of administrative expenses, as "one statistical scientist," at a salary of \$3,000 a year?

Mr. OLMSTED. Mr. George K. Holmes, one of the ablest men in the United States; I am very fortunate in having him in my bureau.

The CHAIRMAN. Who are the other statistical scientists? Do you happen to remember their names? You have three more, have you not?

Mr. OLMSTED. Yes. One at \$2,500, Mr. Charles Daugherty, who has charge of the editorial work and library, and he is also an analyst; he prepares and gets together the material, in a statistical way, with regard to foreign crop conditions; he is a scientist, and a good one, too. Then there is Mr. Frank Andrews, who is a scientist pure and simple; he is not an administrator or routine clerk; he is an original investigator, prepares articles and does special work. Then there is Mr. Fred J. Blair, who has charge of all the tabulations and computations and work carried on in the division of domestic crop reports. It requires much scientific knowledge to handle that work, because it is done along scientific lines entirely.

Mr. McLAUGHLIN. What is the salary of that office?

Mr. OLMSTED. We give him \$2,000. I was able to induce the secretary to promote him to \$2,000 from \$1,800 awhile back. He is a very able man.

Mr. McLAUGHLIN. You refer to that in your report as the most important work of the bureau?

Mr. OLMSTED. Yes, sir; it is the largest in extent and most important of the work of our bureau, the gathering of domestic crop reports; it takes the larger part of our money to do it.

Mr. McLAUGHLIN. The salary of that man is only \$2,000 and the salaries of the others larger, one \$3,000 and the other \$2,500?

Mr. OLMSTED. Yes, sir.

Mr. McLAUGHLIN. How many clerks are in that division?

Mr. OLMSTED. I have the information right here. I will tell you in a moment. Mr. Blair's work is executive and administrative rather than along lines of investigation, but he must have scientific knowledge in order to see that the work is done properly, and he has more clerks under him than anyone else. I have a statement here showing the clerks in the various branches of the office. Mr. Blair has 43 people under him.

Mr. McLAUGHLIN. How does that number compare with the number in the other divisions?

Mr. OLMSTED. Well, it is considerably larger. For instance, in the library and editorial division there are 15 people; in the division of production and distribution there are 15. He has more than the two other divisions together.

Mr. McLAUGHLIN. The work in that division is larger in amount and you speak of it as the most important work of the bureau?

Mr. OLMSTED. I do.

Mr. McLAUGHLIN. Yet the head of the division gets much the smaller salary?

Mr. OLMSTED. That is true.

The CHAIRMAN. How do you account for that?

Mr. OLMSTED. Well, as I said a moment ago, the work does not consist of scientific investigation along original lines. He administers the work that is given to him to work up, and he sees that the clerks do it properly; but he does not do any original work himself. I presume that is the reason why that position is not paid a higher salary. I have urged the promotion of Mr. Blair, and was fortunate enough to induce the secretary to promote him within a year.

The CHAIRMAN. Have there been any other promotions?

Mr. OLMSTED. Not on the miscellaneous roll, no, sir.

Mr. McLAUGHLIN. Has the work of that division increased during recent years?

Mr. OLMSTED. Very enormously, as has the work of the entire bureau; it has increased, since I took charge of the bureau five years ago, 500 per cent, fivefold.

Mr. McLAUGHLIN. Has the expense of that bureau increased in proportion to the amount of work imposed upon it?

Mr. OLMSTED. It has not. We are doing several times the work we did five years ago with slightly fewer employees. The employees there have been doing very much harder work and much more strenuous work than they ever did before; in fact, they have practically reached their limit. Mr. Blair is a man who has the capacity of getting the maximum amount of work out of those whom he directs, and I have been giving him more and more work to do all the time; but he has gotten to the point where he can not handle any more, without increasing the number of clerks under his direction.

Mr. McLAUGHLIN. On the face of it, it would look as though the chiefs of these divisions were not paid in proportion to the amount of work they do and the importance of the work performed.

Mr. OLMSTED. Well, as I have explained, Mr. Blair does not do original work; he does not conduct original investigations, and does not prepare anything for publication; he has charge of the compilation and tabulation of reports.

Mr. McLAUGHLIN. His department does much more work, and you say it is the most important work that the bureau does?

Mr. OLMSTED. I say so, yes, sir; I agree with you thoroughly on that; in fact, I state that in my annual report.

Mr. McLAUGHLIN. Have you made any recommendation for an increase in the salary of the head of the division of domestic crop reports?

Mr. OLMSTED. In the past I have recommended an increase in his salary.

The CHAIRMAN. I understood you to say his salary had been advanced \$200 within a year?

Mr. OLMSTED. Yes, sir; he was promoted in January of this year.

Mr. HAWLEY. What are the hours of labor in your department?

Mr. OLMSTED. From 9 to 4.30, with a half-hour recess for luncheon.

Mr. HAWLEY. Seven hours to a day?

Mr. OLMSTED. Yes; but we frequently have to work longer hours than that, sir. Our crop reports frequently require us to come earlier in the morning and remain after hours; and sometimes we work on holidays.

Mr. HAWLEY. How much overtime does a clerk work on the average?

Mr. OLMSTED. Well, it would be a small average if you take it for the entire year; that is, overtime work, spread over the year would not amount to a very large average.

Mr. HAWLEY. I am getting a great many communications from clerks in the city, and I suppose all of the other Members are, about the proposed increase in the number of working hours.

Mr. OLMSTED. Yes, I have heard a good deal of that myself.

The CHAIRMAN. I notice you pay your special field agents all the way from \$1,200 to \$2,250?

Mr. OLMSTED. Yes, sir.

The CHAIRMAN. Can you state briefly the reason for that distinction?

Mr. OLMSTED. I can state it briefly. When a man gets \$1,200 it simply means he reports as to one crop; he specializes as to that crop; and we could not get a specialist for less money; that is thought to be sufficient compensation for the work he does; the other variations in salary are due to the length of service, the ability of each man, and the territory he covers.

The CHAIRMAN. Just the same argument as would apply to the State agents?

Mr. OLMSTED. Yes. We try to regulate that with reference to the ability of the man and as to the State he works in, as far as we can. We know some ought to have more money than they are receiving; they have been called on to do a great deal of additional work in the last two or three years.

The CHAIRMAN. What can two special agents at \$40 a month each do in the way of gathering cost production?

Mr. OLMSTED. Those are some agents who are working in Minnesota on the project we have been running for some years as to the cost of producing farm products; those men are carrying on this work in connection and cooperation with the Minnesota Agricultural College experiment station, which bears part of the expense; we pay \$40 a month to certain agents who go around among the farmers making a copy of records these farmers keep concerning the cost of producing crops on their farms, the weighing of materials, the measuring of materials, the receipts obtained from things sold, and all the various details that enter into the cost of production.

The CHAIRMAN. Do you pay their traveling expenses?

Mr. OLMSTED. No; we do not pay them any traveling expenses; it is just straight \$40 a month.

The CHAIRMAN. They cover a limited area?

Mr. OLMSTED. They have what they call routes; certain farms within certain routes.

The CHAIRMAN. I remember when this subject came up some years ago, and probably at the time when you first proposed to go into this work, the question was raised as to whether you would get any real value out of it. The suggestion was made that the cost of production of a given crop on a given farm in Minnesota, for example, would not be of any particular value to a farmer on another farm in the same State and certainly not to a farmer on another farm in a different State. I have wondered whether you have, as the result of this work, discovered any sort of a general principle which you believe to be of value to the country generally?

Mr. OLMSTED. Well, the greatest value of this to the country generally is in the fact that this work in Minnesota has evolved a method by which costs can be scientifically ascertained anywhere. Now, the ascertainment of this cost of production is certainly of value in Minnesota, and the method can be applied in any State or in any locality which desires to ascertain the cost of production. Certain States are very desirous of cooperating with us along these lines; there are three or four different localities that are anxious to go into this work with us, but we have not had the money which would enable us to join with them; they can not do it themselves because they do not have sufficient money. If this investigation were started all over the country it would result in the ascertainment of the exact cost of production anywhere and everywhere. It is a very scientific method. It was originally the plan of the present assistant secretary of agriculture, Mr. Hays—that is, before he was connected with the department; it was worked out by him, and it has been improved upon as time has passed.

The CHAIRMAN. Has it evolved anything new, anything that has not been practiced by all business-like farmers?

Mr. OLMSTED. Yes, sir; I think it has. It has instructed farmers just how to transact their business in a businesslike way; it has shown them how to keep track of their own cost of production; they probably had no adequate idea how to do it before; it has been of immense value to them; they all admit that in that particular section of the country.

The CHAIRMAN. Well, offhand, one would think that the question of determining the cost of producing a certain crop would be a very simple matter, that it would be nothing more than keeping an account of the amount of money expended in work on that crop, on fertilizers, on seeds, and all the other items that would go to make up the expense of its production, and, on the other side of the ledger, to give credit to the ground for whatever was obtained?

Mr. OLMSTED. That, in a general way, is the method; of course, it goes into more detail than you have gone into. The point is, the gathering of statistics of that sort from one farmer or two farmers would be valueless; it must be gotten from a large number of farmers in order to be of any particular value and in order that a fair average may be struck. That is what this cost of production has done; the work has been done on farms conducted by men of different temperament and ability and on farms having different kinds of land.

The CHAIRMAN. I would be very glad if you would state, briefly if you can, just what you have derived from the investigation?

Mr. OLMSTED. Well, it is pretty difficult to state it briefly. The reports have been published in two bulletins, and the third one is

in the course of preparation. I might say that, as far as the Bureau of Statistics is concerned, we are only interested in it to the extent of furnishing part of the money; it is entirely under the charge of the professors at the University of Minnesota; they do all the work, they gather all the statistics, they prepare all the bulletins, we simply help them out with some money, our share, and we print the bulletins. That is as far as the Bureau of Statistics goes; we do not meddle with the work.

The CHAIRMAN. Do you know whether or not it is customary throughout the department to cooperate in that way?

Mr. OLMSTED. I do not know the extent to which other bureaus do it, but I know the Bureau of Plant Industry has expressed its desire to join with us.

The CHAIRMAN. I am not questioning cooperation between the bureaus of the department, but I should be a good deal surprised to find that in such cooperation, either with States or individuals, the only part of the Department of Agriculture was to contribute money.

Mr. OLMSTED. Well, as I say, the Bureau of Plant Industry has indicated its willingness to join with us in cooperating with other States in this same line of work by bearing its share of the expense, they paying a third, the State paying a third, and our bureau paying a third.

The CHAIRMAN. Let me call your attention to the question I asked, whether you can state briefly the practical results which you expect to obtain? I may say, in order to give you the thought I have in my mind, that it looks to me as though the statistics which you might obtain in Minnesota, as I said a moment ago, would be of no value in Kansas or any other State of the United States, so far as actually ascertaining the cost of production of a given crop is concerned, because that would vary in another State and would even vary on an adjoining farm and might vary on the same farm in different years. I do not see how you could arrive at anything that would be of general value. Now, as to the method of keeping books, in order to determine the cost of production, I can see how one method might be better than another, and yet it would rather seem to me as though a subject which has been the matter of such universal discussion and of such widespread practice throughout the country for so many years, would not be susceptible of any particularly new development.

Mr. OLMSTED. Well, all I can say to you is that the average farmer, unless there is something to make him do it, will not ordinarily keep these costs. This plan that has been carried into effect in Minnesota in cooperation with the Minnesota Agricultural College, is so devised that the farmers will and do keep actual costs in uniform ways, so that they can be collected and compiled statistically and results ascertained, and methods have been devised which induce them to do that, that is, to get those statistics together; they have set a pattern for other States to follow if they choose to follow, which is of the greatest benefit. It goes without saying that the cost of agricultural products in Minnesota are of no value to the farmer in Texas or Florida—none whatever. But the methods being followed are explained and the result set forth in these bulletins, and the farmers of Texas or Florida can, if they choose, take advantage of those methods and follow similar lines. They are given a method or way of

doing it, a scientific process by which the desired result can be ascertained.

The CHAIRMAN. As the result of these inquiries, have you prepared a form of blanks?

Mr. OLMSTED. Oh, yes; they are described and set forth in these bulletins.

The CHAIRMAN. We will consider for a moment the general expense paragraph. I notice there seems to be no change in the estimate for "Salaries, employment of labor," and so forth, except such as is accounted for, I presume, by the transfer of one or two employees on the statutory roll?

Mr. OLMSTED. Yes, sir.

The CHAIRMAN. There seems to be some increase "For salaries and traveling and other necessary expenses of special field agents." Have you found the present appropriation to be insufficient?

Mr. OLMSTED. Yes, sir. We have had to be very careful as to our field and State agents. We never spend the full limit of our appropriation, because we can not hit the nail exactly on the head, and therefore we spend a little less than the appropriation in order not to create a deficiency. Some of our agents need more money with which to travel, where the jumps are very long. We also need more field agents. We want to employ some additional field agents, because the territory some of our agents now cover is entirely too large to permit any man to do justice to it.

The CHAIRMAN. How many would you employ?

Mr. OLMSTED. At least three more, and four more, if possible.

The CHAIRMAN. There is no estimate for that increase?

Mr. OLMSTED. Yes; there is an estimate here; I think it is included here; an estimate of \$10,000, is there not?

The CHAIRMAN. Yes; but we will come to that later.

Mr. OLMSTED. This increase in the traveling expenses would include the traveling expenses of these new field agents if they are appointed.

The CHAIRMAN. There is an increase of \$500 for "Traveling and other necessary expenses of officials and special investigators."

Mr. OLMSTED. Yes, sir. We need that because it is necessary for the assistant statistician to do considerable traveling in order to look after the field and State agents' work.

The CHAIRMAN. I notice you have a paragraph here "Salaries and traveling and other necessary expenses for investigating the cost of production of farm products." Whom have you employed in that work and who travels at the expense of the department? I believe you have stated that the agents who are referred to on the other page are not paid any traveling expenses.

Mr. OLMSTED. Yes; that is right. But the man in charge of it, Prof. Thomas Cooper, must once in a while come to Washington; he must bring some material which has been collected, and we tabulate it for him in the office at Washington. The only traveling expenses would be the fare and other expenses to Washington and back in connection with this work, which really would be very slight.

The CHAIRMAN. Is that the only case?

Mr. OLMSTED. That is the only case in which any traveling expenses would be incurred in connection with investigating the cost of production of farm products in Minnesota.

The CHAIRMAN. Two thousand five hundred dollars would pay for at least 25 trips, I should think.

Mr. OLMSTED. But the salaries come out of that also.

The CHAIRMAN. How much?

Mr. OLMSTED. For himself and these men who work for him.

The CHAIRMAN. Oh, that includes the salaries?

Mr. OLMSTED. Yes; that includes the whole business.

Mr. LEVER. What paragraph provides for those additional field agents? For the traveling and other necessary expenses of special field agents there is an increase of \$7,500?

Mr. OLMSTED. Yes; and that includes the salaries.

Mr. LEVER. And you would employ about three or four additional men?

Mr. OLMSTED. Yes; in order to cut down the territory of some of those who are now working, and we shall use a part of that increase, if possible, in promoting a few of our agents who deserve promotion, who have been working strenuously and faithfully with a view of getting promotion, and who would be discouraged if they did not get it. They ought to be rewarded for the services they have rendered. Some of them are not now paid enough salary, and we expect to use a part of this increase in that way.

Mr. LEVER. I have a letter here from a very intelligent farmer in my State, Mr. A. W. Brabham, inquiring whether the Census Bureau or the Department of Agriculture gathers statistics with reference to upland long-staple cotton and publishes those statistics?

Mr. OLMSTED. No; we do not. I do not know what the Census Bureau may do. They are equipped for that sort of thing, but ours are all estimates, and we could not readily get those figures. In many sections it would be very difficult to get statistics as to upland long-staple cotton; the Census Bureau might do it.

Mr. LEVER. As a matter of fact, the Census Bureau does not do it. And you say it would be almost impossible for your bureau to make an estimate of that particular kind of cotton?

Mr. OLMSTED. It would, just as it would be almost impossible to estimate the different kinds of apples or the different varieties of wheat.

Mr. LEVER. You have no account of the upland staple cotton produced in this country?

Mr. OLMSTED. No, sir; and I have never seen any statistical account of it; it would be very interesting if it could be gathered.

Mr. LEVER. He makes the statement that 90 per cent of the cotton mills of South Carolina are using this class of cotton, but I think he is mistaken in the statement.

Mr. OLMSTED. At first blush I would think so, too, but I do not know enough about it to say.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 16, 1910.

MORNING SESSION—continued.

The CHAIRMAN. Representative Hardwick, of Georgia, desires to occupy the time of the committee for a few minutes in presenting a matter that interests him. We will hear him now.

STATEMENT OF HON. THOMAS W. HARDWICK, A REPRESENTATIVE FROM THE STATE OF GEORGIA.

Mr. HARDWICK. I am very much obliged to you; I hope the matter will interest you as much as it does me. I have a constituent who is quite a successful seedsman; he sells seeds, and he has wide experience in truck gardening and farming. For some years he has been interested in the proposition of having a winter experimental garden established somewhere in the Southeast, in what is regarded, especially by the people who live in that vicinity, as a good winter climate. As he has stated it much more strongly than I could hope to, I want to read what he has written upon this subject [reads]:

The American farm has received almost prodigal help from our Government. The American garden, however, has received practically nothing. Thousands and thousands of Government demonstration and experimental farms cover the land. Should not something now be done for the American garden?

The one thing needful.—As an adjunct to the farm, or as an independent proposition, the garden has strong claims upon the Government. These claims have not been sufficiently recognized. There needs, indeed, to be a national awakening by people and by Government as to what the garden means—in its uses and its value.

The garden's meaning.—The garden means intensive culture on rich soil, wide variety in plant types, and such a quick economic succession of crops as will make the land evergreen. The garden gives an esthetic value to all of those farms so numerous in our land, that crowd their cotton corn and wheat crops close up to the farmers' doorsteps. The garden gives the grower a wide and almost endless variety of healthful, fresh, delicious foods in place of the store-bought hog and hominy diet. In money value the garden is the greatest dividend payer on earth, netting the owner often times 3,500,750, and \$1,000 per acre.

The garden's inestimable value is especially stressed to-day in the South where the universal boll weevil is radically transforming all agriculture.

The place for a great national semitropical experiment and demonstration garden.—The intent of this paper is that the United States Agricultural Department shall be given by this present Congress a special appropriation of \$16,000, which sum is for the purchase of a plant of some 30 acres, and outfit, and for the first year's maintenance, of a national semitropical experiment and demonstration garden at Augusta, Ga.

Augusta, Ga. (a well-known national health resort), is in the center of the great trucking industry of the South, as found in her piney woods and sandy loamy soils, and which stretches from Augusta northeast through the Carolinas, and south through Florida, and west through the Gulf States. An experimental garden at Augusta should serve all of the above territory; whereas a garden, say at Washington, D. C., through different climatic conditions would not serve at all.

The object of the Augusta, Ga. experiment and demonstration garden.—The objects of this semitropical garden would be, first, to try out and test all new types whether American or imported, and to place comparative values on same; to demonstrate proper cultures for given plants; to demonstrate out turn; to demonstrate how to market; and to discover synonyms. Its object would be to increase the number of scientific market truckers in the South; and also largely increase the quality and the quantity of farmers' gardens. This determination of synonyms, (one English pea is known under 46 names) and comparative values would be of greatest use to the seed houses of the country. So necessary is this determination, that one English contract-growing seed house on 26 acres of land annually conducts 20,000 tests, while a still larger English house conducts 80,000 tests.

This garden would be of the greatest help to the trucking industry now established within 100 miles of Augusta which ships north yearly something like the following:

	Cars.		Cars.
Beets.....	60	Cucumbers.....	400
Cabbage.....	2, 000	Squash.....	15
Carrots.....	15	Beans.....	450
Asparagus.....	85	Tomatoes.....	10
Potatoes.....	1, 550	Peas.....	75
Lettuce.....	60		

Now, Mr. Chairman, without elaborating this proposition, my constituent (who is considered the largest seedsman of the Southeast, Mr. N. L. Willett, of the Willett Seed Co. of Augusta), states to me that he has repeatedly taken this up with the Department of Agriculture and, as I understand him, the department has looked with favor on the proposition and thinks it is a good thing, but lacks the necessary authority in law to establish this experimental garden in this particular winter section. Now, I do not know what view the committee may have of it, but as it involves a comparatively small expenditure, and if the results are as promising as he seems to think they are—and his standing in this particular line of agriculture, gardening he calls it, is sufficiently great to give his opinion some weight—the matter is entitled to the serious consideration of the committee, and I believe from what he tells me the Secretary of Agriculture would unhesitatingly approve of it if it were submitted to him and would recommend that Congress give him this appropriation.

Mr. McLAUGHLIN. Has this request ever been made of the legislature of the State of Georgia?

Mr. HARDWICK. I think not.

Mr. McLAUGHLIN. Has the legislature ever taken any action along this line or made any appropriation?

Mr. HARDWICK. Of course we have a State department of agriculture, but, as you gentlemen all know, when it comes to any considerable appropriations for matters like this they look primarily to the Federal Government. There is another reason why that question would not be exactly apposite in this particular matter, and that is that a part of this territory is in South Carolina, Augusta being right on the line, and anything done by the legislature of Georgia would not have any application in South Carolina. You appropriate for experimental ground in other places, and the same reason would apply to support an appropriation for this man for an experimental garden.

The CHAIRMAN. The difference between anything we are doing and the proposition you submit lies in the fact that you propose the purchase of ground, which implies the perpetual maintenance of a tract of ground for this purpose; there is no precedent for that as far as I know.

Mr. HARDWICK. Have we not experimental farms in the District of Columbia that were purchased and now owned by the Government? I do not mean in the District of Columbia, but I believe it was in Maryland.

The CHAIRMAN. A farm was purchased in Maryland, but it was not called an experimental farm and not intended for experiment so far as farming was concerned; it was simply intended as a kind of a laboratory in which to carry on experiments and investigations relating to the production of live stock.

Mr. HARDWICK. Precisely; that is what we propose here—a laboratory to carry on investigations in regard to the production of garden products, the classification of them, and so forth. It struck me, while you were making that statement, that probably this Maryland project was a precedent.

The CHAIRMAN. It would be as near to it as anything.

Mr. HARDWICK. As a State rights Democrat I think the Department of Agriculture does a great many things which strict constructionists could not favor, things that are contrary to the old-line Democratic theory, but I think this proposition is no different from propositions that are carried out every year.

The CHAIRMAN. One of your Democratic colleagues on this committee—and I am sorry he is not now present—suggested yesterday that he had it in mind to offer a motion that the Department of Agriculture move out of the South and try to get into the Union. But that was probably by way of pleasantry, and in order to dispose of this matter I would suggest that the communication you have read be included in the record and the committee will give it very careful consideration.

Mr. HARDWICK. I do not ask you to take any action in my presence, but I would ask, if it is proper, that you confer with the department as to the practical value of this proposition.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 16, 1910.

MORNING SESSION (CONTINUED).

The CHAIRMAN. The committee will proceed to the consideration of the estimates for the library. I have not thought it necessary to bring the Librarian before the committee to explain the very few and very minor changes. We have with us Mr. Zappone, who is familiar, I take it, with the details of this estimate, and he will no doubt be able to give this committee any information it may desire. I would like to ask Mr. Zappone just one or two questions. I take it, of course, that the additional help asked for is considered to be necessary on account of the growing demand upon the library?

Mr. ZAPPONE. That is right, sir.

The CHAIRMAN. Directing your attention to the new language on page 74, can you explain to the committee just why it is thought necessary to provide "That hereafter employees of the library may be temporarily detailed by the Secretary of Agriculture for library service in the bureaus and offices of the department, and employees of the bureaus and offices of the department engaged in library work may also be temporarily detailed to the library."

Mr. ZAPPONE. At the present time there are branch libraries in almost every bureau of the department. While the books in these branch libraries are under the supervision of the librarian of the department, the employees engaged therein are carried on the rolls of the several bureaus. The librarian is of the opinion that if she not only had supervision of the branch libraries themselves, but also of the personnel, the library service would be much more effective service; and in order to accomplish this, she wishes this provision of the law passed, under which details may be made to and from the library. All clerks engaged on library work could then receive proper training in the main library, a course which would insure uniformity in the system installed in the branch libraries. At the present time there is a law which prohibits the detailing of a clerk from one bureau to another, except to and from the secretary's office. The librarian is therefore unable to detail clerks from the main library to one of the branch libraries, or vice versa. In a way the suggested legislation amends an original statute, which I believe this committee was responsible for passing, and may therefore be somewhat objectionable to the committee, in which case it may be omitted.

The CHAIRMAN. The only objection that occurs to my mind in connection with it is that there might possibly be a divided authority over these employees in the branch libraries which might lead to complications. As it is now, of course, the branch library is under the direct authority of the chief of the bureau where the branch library is located, and the employees take orders from him, I pre-

sume, and there might be a possible complication if there was any conflict in authority between the chief of the bureau in which the library is located and the librarian.

Mr. ZAPPONE. I think there need be no fear on that score, for the reason that the bureaus are cooperating with the librarian and this provision has their approval; in other words, they are entirely willing that the librarian shall have supervision not only over their libraries but over the personnel.

The CHAIRMAN. Passing to the paragraph under the head of general expenses, you will notice a proposed change of language. You will no doubt remember that the present language was purposely and expressly devised to make it impossible that a miscellaneous library should be assembled in the library of the Department of Agriculture; and it is for that reason that the word "technical" is repeated so often. Can you explain to the committee in just what way the use of that word limits the library of the Department of Agriculture in such a way as to restrict its usefulness?

Mr. ZAPPONE. I consulted with the Librarian this morning in regard to the matter, and she informs me that these changes were made primarily for the purpose of eliminating the word "technical" in two places, which not only simplifies but improves the language. She also makes the point that books of reference may not always be technical books—as, for example, dictionaries, atlases, encyclopedias, and books of that character. As the law now reads it would almost seem to prohibit the purchase of such books. However, as she has purchased those books in the past, and feels that she would be fully justified in purchasing them in the future, she is quite willing to have the language remain as heretofore if there should be any objection to the new words.

The CHAIRMAN. Has any member of the committee any other questions to ask Mr. Zappone in connection with the library? If not, we will proceed to the consideration of the estimates for the Office of Experiment Stations.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 16, 1910.

MORNING SESSION—continued.

The CHAIRMAN. Dr. True, Director of the Office of Experiment Stations is here and we will be glad to hear any statement he may wish to make in a general way as to the work relating to his office, and afterwards take up the details of the estimate.

**STATEMENT OF MR. A. C. TRUE, DIRECTOR OF THE OFFICE OF
EXPERIMENT STATIONS.**

MR. TRUE. At the suggestion of the chairman of the committee I have prepared a brief written statement.

The business of the Office of Experiment Stations necessarily increases with the growth of the movement for agricultural education and research in this country and abroad, since the office touches all phases of this movement at some point. The revenues of the State agricultural experiment stations have steadily risen from both Federal, State, and local sources until they now aggregate over \$3,000,000 annually, as compared with half that amount five years ago. Not only has the amount of their work doubled but its range and complexity have greatly increased. Scientific investigations have been largely amplified and the more practical field operations have greatly increased in number and variety to cover the different agricultural regions of the several States. State legislation has given the stations a large amount of inspection work in numerous lines and they have also been called upon to contribute fully their share to the popularizing of the new agricultural knowledge through demonstrations, institutes, and other forms of extension work. New questions of administration, equipment and service are constantly arising and in all these matters the advice of the Office of Experiment Stations is increasingly sought.

During the current year the appropriation under the Adams Act reaches its maximum of \$720,000, which, together with the Hatch fund of equal amount, make an annual Federal appropriation of \$1,440,000, the expenditure of which must be supervised by this office. Experience has shown that since we are dealing with complex and rapidly growing institutions, of which the experiment stations are a part, with boards of management whose make-up is constantly shifting; with administrative officers and staffs whose personnel is rapidly changing and expanding and who are under constant pressure to undertake more work than they can safely carry, the functions of a central agency with a fixed policy and a wide knowledge of the whole field are more and more important.

The direct authority of this office is quite limited; its chief influence rests upon the character of the advice it is able to give and the moral pressure it is able to exert.

For the past four years the office has strenuously exerted itself to raise the general level of the scientific work of the stations when the Adams fund permitted its great expansion. It is impracticable to explain in a few words what this has meant. The relative newness of agricultural science with the consequent lack of sharp definition of its problems; the comparative youth and inexperience and relatively limited training of many of the available investigators; the inability of boards of management and administrative officers in many cases to distinguish original research—these and many other factors have made the task of the office one of unusual delicacy and difficulty. It is needless to say that we could not alone have accomplished what has been done. It is only by getting the consensus of opinion of those best able to judge in such matters and by studying the work and methods of those stations, administrative officers and investigators who are doing things in the right way and by focusing the results of our studies on the weak places throughout the United States that we have been able to do what we have done in this direction.

We have the most comprehensive and the most successful system of experiment stations, but its great breadth and the expectation which its success has created have multiplied the administrative and technical questions pressing for solution. The stations have done so well that they are expected to do much better and it is to this end that they desire our aid more largely.

There is no doubt that the Adams Act has raised the general level of the experimental work of the American stations; it has also led the States to greatly extend their more practical operations. Agricultural science will grow chiefly through numerous small contributions to knowledge and of these a relatively large number have been gained by our stations during the past few years.

Some fundamental and far-reaching results have also already been obtained with the aid of the Adams fund. These may be illustrated by the following: The Maine station has shown that high egg production is a family quality and inherited only within families having the ability to transmit it. On this basis a satisfactory method of selection has been worked out. The same thing has been found true with corn. High quality in some respects in the individual plant may not be transmitted but such transmission occurs within certain families.

A new standard for feeding dairy cows has been worked out by Prof. Haecker of Minnesota, which is more practical and economical under American conditions than the German standards.

It has been definitely shown by Prof. Lipman of New Jersey that such crops as corn, oats, etc., profit by the ability of legumes to assimilate the free nitrogen of the air. How this interchange of material takes place is being studied.

The Wisconsin station has shown that grain crops, for example, remove from the soil nearly as much sulphur as phosphoric acid, whereas the soil supply of sulphur is far less.

The phosphoric acid in virgin soils has been found to be changed in form in worn-out soils. That is, in virgin soils it is combined with humus, which is burned out in old soils and then the phosphoric acid is far less available to plants.

Those statements will suffice to show the fundamental character of some of the researches now reaching completion in some of our stations under the influence of the Adams Act.

JOURNAL OF AGRICULTURAL RESEARCH.

The influence of the Adams Act in stimulating research would be more evident if we had been able to secure prompt and adequate publication of the scientific work of our stations. The use of Federal funds for printing is confined to the Hatch fund. This has been supplemented to a considerable extent by State funds, but the pressure for popular presentation of station work has been so great that the funds available for printing have generally been used in that direction. The general result of the present system of station publication is a miscellaneous mass of popular, semipopular, and technical literature very unsatisfactory to both farmers and scientists.

Moreover a large amount of the best scientific work either remains unpublished or is inadequately presented in journals, many of which are published abroad and in foreign languages.

After long consideration of this matter, the Association of Colleges and Experiment Stations and the Secretary of Agriculture have agreed to ask Congress to provide a central medium for the publication of the scientific work of the stations. I have studied this matter very carefully and believe this is the only satisfactory solution of this difficulty. Most of the work which would be thus published is of general rather than State or local interest. It can be published more economically and in better form by the United States, and it will be more generally and promptly available to our own investigators and to the great scientific world.

Such an arrangement will also leave the stations free to publish their practical results in better form for practical men and thus make their publications more efficient means for advancing agricultural practice.

INSPECTION OF STATIONS.

The inspection of stations includes the examination of accounts and vouchers and the checking up of these with the work covered by them (which is often carried on in several localities in a single State), the inquiry into the relation of these expenditures to those from State or college funds and the determination of the relation of the station's work to that of the college extension department, or inspection service, in order to decide whether the station has been fairly dealt with. This requires more time than formerly because of the greater extent of the funds and work.

EXPERIMENT STATION RECORD.

Two years ago Congress granted us a small increase of appropriation to enable us to extend our review of the world's literature of agricultural science in the Experiment Station Record. This has borne good fruit and we have brought this review closely up to date. Last year 20 numbers of the Record were published. This literature is increasing in volume and we are asking a little additional sum to enable us to keep up with it in the future. This is one of the most appreciated helps to investigators in the department and the stations and prevents duplication of work.

POPULAR PUBLICATIONS.

This office also tries to keep in close touch with the needs of practical farmers and prepares numerous popular publications. Last year 17 new Farmers' Bulletins were printed (out of 45 for the whole department), 12 of which embodied results of investigations by the office, and 5 results obtained by the stations. (Eighty-two of our Farmers' Bulletins were reprinted.) In addition 8 bulletins were issued through our insular stations. Congress voted an extra 500,000 copies of one of our Farmers' Bulletins, and 900,000 were distributed in the ordinary way. The total number of copies of our Farmers' Bulletins issued during the year were 3,600,000.

ADVISORY WORK.

In its relations with the agricultural colleges, schools, experiment stations, and farmers' institutes, as well in other phases of its work, this office is acting more and more in an advisory capacity. It is, perhaps, not generally realized to what extent this function of the Federal Government is being developed in recent years. With over 50 great States and Territories (including our insular possessions) in our vast domain there are constantly arising new questions of public concern on which the people and officials of these States desire to have information concerning what has been done elsewhere, or the judgment of those who have made a broad study of these or related subjects. If the Federal Government did not exist there would be a tendency for the States to seek the establishment of agencies for mutual council. This tendency of our times is illustrated in the Bureau of American Republics, or the Pan American Union, as it is now called. But having the Federal Government, the States are glad to have it aid them in this way, and it is on this plan that a large part of the business of the Office of Experiment Stations is conducted.

We do not say to the colleges and stations or State drainage commissions or irrigation officials, "you must do thus and so," but rather "this is what is being done in other States, or in foreign countries; or these are facts as far as the subject has been developed; or these are our conclusions after examining the matter."

The value of such advice, of course, depends on the thoroughness of the preliminary study and the impartiality and good judgment shown in collecting, classifying, and discussing the facts. That such advice is appreciated is shown by the increasing demand for it and by the cordial relations existing between our office and the various State agencies with which we deal.

An interesting phase of this matter is shown in the recent development of the Association of American Agricultural Colleges and Experiment stations. With its three sections of college, station, and extension work, its standing committees representing these sections, and its biennial Graduate School of Agriculture, the association is practically at work all the time promoting the general interests of all the States as represented in their institutions for agricultural education and research. The Office of Experiment Stations is represented on the officary and committees of this association, is the depository of much valuable material collected by it, and is itself collecting and arranging the facts on which in large measure the association acts.

The conclusions of committees constituted in this way are not imposed on any institution, but are published for their information. It is a voluntary union of National and State agencies which has been productive of great good to a great cause.

To do work of this kind in the best way we must have a permanent force of broadly trained and thoroughly competent experts; and the conditions of the service must be such as will secure and retain such men.

RESEARCH WORK.

By the action of Congress and the secretary, the office has become one of the large investigating bureaus of the department, our appropriations for this purpose aggregating \$268,240. The work is conducted in five main lines, (1) maintenance of experiment stations in Alaska, Hawaii, Porto Rico, and Guam; (2) a study of problems in agricultural education; (3) nutrition investigations; (4) irrigation investigations, and (5) drainage investigations.

INSULAR STATIONS.

Only a few of the most striking features of the work of the stations will be mentioned. In Alaska the crosses of native and commercial varieties of strawberries have given us 20 excellent hybrids. We have had two unusually good seasons at Rampart (65° 30' North Latitude), and many varieties of barley, oats, wheat, and rye have matured. Plant breeding is being done there. At Kodiak we have over 60 Galloway cattle which have wintered on native hay and silage, 80 Cotswold and Merino grade sheep, with 2 Lincoln rams; at Fairbanks grain and hay and potato farming is carried on, 65 acres being under plow and 50 cleared for meadow.

In Hawaii, Sea Island, and Caravonica cottons grown perennially and fertilized with phosphates yield two bales and more per acre on land not used for sugar cane. Cuttings can be used for propagation and pruning timed to bring crop when sugar plantation work is slack. The first shipment of cotton is made to Boston this week.

The CHAIRMAN. Do you know where that cotton was grown—on what island?

Mr. TRUE. That was grown on the island on which Honolulu is located, as I understand it.

The CHAIRMAN. Well, last year there was quite a large cotton plantation on the island of Kauai.

Mr. TRUE. Yes; that is still being maintained; there are, I think, now about a thousand acres in all the islands planted in cotton.

Mr. LEVER. How does the staple of that cotton compare with the ordinary cottons of this country?

Mr. TRUE. The sea-island cotton is like our own sea island and the Caravonica cotton is a high-grade cotton of which there are two kinds; one is called wool cotton and the other is silk cotton.

Mr. LEVER. Is it a long-staple cotton?

Mr. TRUE. Yes.

Mr. LEVER. On the order of sea-island cotton?

Mr. TRUE. Yes, sir; the silk Caravonica cotton is used especially in cotton mercerizing and is very valuable.

Mr. LEVER. Is the staple as strong as the staple of the sea-island cotton?

Mr. TRUE. I understand it is.

Rice experiments have shown ammonium sulphate is cheaper than nitrate of soda and doubles the yield if fertilizer is applied at planting or first flooding instead of at second flooding, as in oriental practice.

As a result of the station's work, pineapple culture is spreading rapidly but hindered by manganese and iron in soil. This is being remedied by fertilizer experiments.

Rubber trees on 500 acres now five or six years old are being tapped and experiments have shown that clean cultivation increases flow of sap. Weeds have been killed by spraying with arsenite of soda, at \$1.25 per acre.

In Porto Rico the station has shown that excessive growth of bacteria in certain soils prevents good crops, and that deep plowing and use of chemicals will remedy this; also that chlorosis of pineapples is due to excessive carbonate of lime in the soil. Windbreaks proved to be essential to citrus fruit culture, because they regulate moisture and enable beneficial fungi to keep down scale insects.

Coffee experiments are proceeding on 90 acres of old coffee plantation near Mayaguez and 20 acres north of Ponce. The famous high-priced varieties, such as Blue Mountain of Jamaica and Padang of Java, have done well and are now ready for distribution. Three-year old trees produced one-half pound clean coffee. The allotment of \$5,000 for coffee experiments in the appropriation act did not materially affect our plans but is an unfortunate precedent.

In Guam the station has 20 out of 27 acres in recently purchased tract under cultivation. Office and laboratory building, stable and implement shed have been erected, and a water system installed.

Emphasis is laid on experiments with forage crops—e. g., sorghums, grasses, soy beans, velvet beans, and cowpeas—preparatory to introduction of animals. The soil needs legumes. The natives are interested, but want "to be shown." Twelve small cultivators, worth \$5 apiece, were sold within four hours after landing. With these one man can do as much work as ten with the old-style implements.

AGRICULTURAL EDUCATION INVESTIGATIONS.

The past two years have witnessed a remarkable expansion of the movement for agricultural education. The number of students in the agricultural colleges has greatly increased—e. g., 1,300 in New York, 400 in Minnesota—23,000 in all. Their courses have been greatly broadened to include such subjects as agricultural mechanics and engineering, farm management, rural economics, and sociology. The general awakening of interest in the human problems involved in the best organization of our agricultural communities has profoundly affected all the institutions for agricultural advancement. The graduates of our agricultural colleges are going back to the farm so generally that it is increasingly difficult to hold out the number necessary to man the educational and research institutions.

Instruction in agriculture is rapidly spreading into private colleges, public high schools, normal schools, etc. Within a little over a year the number of institutions teaching agriculture rose from 545 to 875, of which 630 are of secondary grade.

The number of farmers' institutes has risen to over 5,000, and women and children as well as the adult farmers are now receiving instruction in large numbers through institutes, clubs, and other forms of extension work. The aggregate attendance at the institutes last year was 2,700,000. The agricultural colleges are everywhere forming extension departments and seeking to reach the masses of our rural population.

This rapid expansion of new educational enterprises in a field where things are yet very largely in an experimental stage has brought upon us demands for service which we can not meet. With a force of four men we are attempting to make a broad study of the problems of agricultural education in schools and extension work and aid the several States to organize this vast work in the most effective way. To do this we should keep in personal touch with what is going on throughout this country and Europe, and issue publications of general interest and value. Our work is well illustrated by what has recently occurred in New York, where we have cooperated with the Cornell College of Agriculture and the State Department of Education. In New York the desire has been to introduce agriculture into the high schools, to establish special agricultural schools, and to secure State aid for the agricultural college. We have given the authorities there all the information and personal assistance we could. By legislation the State has fixed its policy to give State aid to its agricultural college, to establish a few agricultural high schools, and to subsidize the public high schools introducing agriculture. An office of agricultural education has been established in the State Department of Agriculture and one of our best men has been taken to conduct it.

NUTRITION INVESTIGATIONS.

A good beginning of experiments on digestion of cheese and meat in a mixed ration was made with the new respiration calorimeter. Similar studies of fats, lard, butter, olive oil, cotton-seed oil, etc., will follow. Practical cooking tests of various meat preparations were made, and a farmers' bulletin issued on economical use of meat in the home, about 1,500,000 of which have been distributed. Similar work is being done with cheese. A set of 15 colored charts has been printed for schools, showing nutritive value of different products. Five bulletins were issued during the year. It is desired to extend the nutrition investigations next year.

IRRIGATION INVESTIGATIONS.

About \$300,000,000 have been invested in private irrigation projects and \$60,000,000 in Government projects during the past ten years.

Settlement in new irrigated regions is proceeding rapidly on both Government and private projects. The settlers or intending settlers are largely from humid regions, hence we have laid special emphasis on procuring and disseminating information regarding irrigation methods adapted to various soils and crops. Twelve bulletins were issued during the year, and others are in preparation. Personal advice and demonstrations are being made by our agents. Much of this is necessary if we are to have prosperous and contented commu-

nities speedily on these new lands. We need more men for this work, and are asking for a few additions to our force.

Every year emphasizes more strongly the need of preventing waste of water in arid regions, which is now enormous. Experiments are being made on the cost and effectiveness of canal linings and methods of treating ditches to lessen seepage, also to determine definitely the results of irrigation methods as related to times of irrigation, cultivation, evaporation, percolation, etc. Only thus can irrigation practice be put on a rational and permanent basis. This work should be extended.

Tests of windmills, engines, and pumps in actual use for irrigation are being continued in Wyoming and California and the rice districts of Louisiana and Texas.

Several experimental farms to determine the cost and methods for utilizing small water supplies supplementary to dry farming are being continued. This year's results showed emphatically the value of even limited areas devoted to irrigation.

In the humid region of both the Atlantic and Pacific coasts interest in irrigation in periods of drought or to stimulate the growth of fruit and truck crops is growing, and we are endeavoring to suggest less expensive methods, using agents familiar with methods in arid regions.

DRAINAGE INVESTIGATIONS.

Drainage investigations are being actively prosecuted along the same lines as heretofore. The special report requested by Congress shows that drainage plans and surveys for over 9,000,000 acres have been made in four years, at a cost of 3 cents per acre. Besides this, preliminary examinations of large areas have been made, many technical problems studied, and much consulting work with local engineers, drainage commissioners, and other State officials has been done. In 1910 our operations covered 27 States, reaching from the Atlantic to the Pacific. Conservative action in entering on new work is shown by an unexpended balance of \$5,000 last year, because plans under consideration had not reached a stage which required more extended prosecution.

Mr. LEVER. Where can these reports be had—these drainage reports?

Mr. TRUE. We have published a considerable number, which can be obtained at the department.

Mr. HAWLEY. You spoke about spraying some weeds in order to kill them.

Mr. TRUE. Yes, sir.

Mr. HAWLEY. By the use of arsenite of lead?

Mr. TRUE. Arsenite of soda.

Mr. HAWLEY. Did that destroy the portion of the weed above the ground, or did it kill the root?

Mr. TRUE. I understand it killed the portion of the weed above the ground. It will probably have to be repeated from time to time.

(Recess until 2 o'clock p. m.)

AFTER RECESS.

The committee met, pursuant to the taking of recess, at 2 o'clock p. m., Hon. Charles F. Scott (chairman) presiding.

STATEMENT OF A. C. TRUE—Continued.

The CHAIRMAN. The committee will come to order. Mr. True, I was very much interested in the statement you presented at the last session of the committee, and I would like to ask you a few questions in relation to some parts of it. I listened, of course, to what you said about the new scientific publication for which an estimate is inserted, and it occurred to me to inquire why the papers which you would expect to print in this new periodical could not properly appear in your Experiment Station Record. Do you confine the articles in the Experiment Station Record strictly to contributions from men engaged in the experiment station work?

Mr. TRUE. The Experiment Station Record is a review journal, which includes only abstracts of matter already published. In that journal we take in both foreign and domestic work, but it would be an entirely different character of journal that we have in mind now.

The CHAIRMAN. Have you worked out in your own mind the details of management of this new journal, who would constitute its board of editors and determine what articles should appear in it, and things of that sort?

Mr. TRUE. Some attention has been given to that matter, and the general plan would be something like this: The association of colleges and stations would designate a board of experts representing different branches of agricultural science. This board would be expected to pass on the scientific character of the articles submitted. After they had done that the articles would be taken up in the Office of Experiment Stations and put in form for publication. That would require a competent scientific man as general managing editor and one or two clerks to assist him, I should say.

The CHAIRMAN. Would you expect the \$20,000 asked for to cover the expense of printing?

Mr. TRUE. Yes, we inserted the term "printing" in the item. The principal expense would be the expense for printing.

Mr. HAWLEY. Would you expect to pay for these articles; that is, to buy them?

Mr. TRUE. Oh, no, sir; they would be given to us free of charge.

Mr. HAWLEY. Do you think you could get a sufficient number to put out a monthly magazine of the articles that you think should be included in such a publication, without paying anything to the men who write them?

Mr. TRUE. It is not contemplated to make it a monthly in the strict sense of the term. We would issue numbers as material accumulated.

Mr. HAWLEY. Oh, yes.

Mr. TRUE. In taking this matter up, I may say I have looked into what was being done in a similar way by the National Museum. They confine their contributions, as I understand it, to the museum force; but the principles involved are the same. They publish what

is known as the Proceedings of the National Museum. I have one volume of it here. That is a series of original contributions to science.

Mr. HAWLEY. The men who write that are all engaged in public business—public employment?

Mr. TRUE. Yes.

Mr. HAWLEY. Is it a part of their duty to write those articles?

Mr. TRUE. I understand it is.

Mr. HAWLEY. You would confine the articles in this publication to men who are already in the Government employ?

Mr. TRUE. Not in the Government employ, but in the employ of the experiment stations.

Mr. HAWLEY. But you would not expect to get contributions from men outside of Government employ who might be of very high attainments in some department of experimentation or agricultural investigation?

Mr. TRUE. Oh, no; it is not intended to open it to the scientific world.

The CHAIRMAN. Do I understand you to say, then, that you do not expect to publish any articles except from men who are now employed in the various experiment stations throughout the country?

Mr. TRUE. That is all.

Mr. LAMB. Where does the demand for this publication come from, chiefly?

Mr. TRUE. It comes from the experiment station workers and from scientific men.

Mr. LAMB. In the agricultural colleges?

Mr. TRUE. The agricultural colleges, experiment stations, and the scientific world generally, who are interested in these matters.

The CHAIRMAN. Coming back, then, for a moment to my former question, you say that the Experiment Station Record is devoted to presenting merely abstracts and condensations of articles that would be of interest to the men engaged in the experiment station work. Do you make any exceptions and print at any time an entire article contributed directly to the Record by some man engaged in this work?

Mr. TRUE. That has not been done in recent years?

The CHAIRMAN. It has been done in former years?

Mr. TRUE. When the Record was first established we occasionally printed a contributed article, but with the growth of the literature requiring to be abstracted we found that we could use our space to better advantage to confine the Experiment Station Record to abstracts, and to brief editorials in which we commented on literature already published, and advised the stations regarding lines of work which they might take up.

Mr. HAWLEY. Could you not modify the character of this Record somewhat and possibly enlarge its scope of activity so as to include matter such as is proposed to be included in the new publication?

Mr. TRUE. I do not think that that would be a desirable thing to do. The Record has an abundance of material to make it, in its present form, and by keeping it strictly an abstract journal we are able to get it out quite promptly.

Mr. HAWLEY. How many pages does it usually contain?

Mr. TRUE. Just 100 pages in each number.

Mr. HAWLEY. And how many numbers per year?

Mr. TRUE. We publish now two volumes of 800 pages each, with an index amounting to about 100 pages more.

Mr. HAWLEY. That is about 16 numbers a year?

Mr. TRUE. Yes; that would be the regular output. Now, the preparation of these long articles would involve some delay. Then the material would come to us irregularly, and I can not see that it would be any more economical, and I do not think that it would be so satisfactory, to combine the two enterprises.

Mr. HAWLEY. Suppose, instead of issuing 16 numbers a year, you issued 24 numbers, making it semimonthly, and had in each of these numbers one or two of the articles such as you contemplate publishing in the new periodical; would not that increase the value of the Record, to have it contain original research matter in full, and then with this condensation of matter that you publish now?

Mr. TRUE. Yes; it would increase the value of the Record, but I do not think it would be the best form of presentation. Then there is this other consideration. We are proposing to issue this research matter in a very limited edition. The Experiment Station Record, on the other hand, is sent to a considerably larger number of people.

Mr. HAWLEY. How many are distributed?

Mr. TRUE. The present number is 7,500.

Mr. HAWLEY. About three times the number per year?

Mr. TRUE. About three times the number per year for this other journal.

Mr. McLAUGHLIN. Generally speaking, much of the material that you collect from the experiment stations is published in popular form, or to meet the popular demand, and as the chairman says, much of the matter that is of real scientific interest is condensed and abbreviated. Is it your idea to have a work in which the scientific researches are enlarged upon, and articles written by the men who have made these researches?

Mr. TRUE. Yes, sir; the articles in this proposed journal would be the original detailed reports of scientific investigations. They would contain diagrams and illustrations of various kinds.

Mr. McLAUGHLIN. I notice in your publication you give the results of the work of the experiment stations, but the details are not worked out. The notices of the work are very brief. Is it your idea to have lengthy articles prepared by men who have done this work?

Mr. TRUE. Yes.

Mr. McLAUGHLIN. Articles that would be valuable to and be used by scientists and scientific students?

Mr. TRUE. Yes.

The CHAIRMAN. Are there any further questions of a general character? If not, we will turn to the estimates as they appear on page 95 of the bill. The committee usually prefers to discuss the question of increasing the salary of the chief of any bureau or office with the secretary, out of consideration for the modesty of the chief. However, if you have anything you would like to submit to the committee in connection with this estimate, we will be glad to hear it.

Mr. TRUE. Yes; I do not desire to say anything about it.

The CHAIRMAN. You are willing to admit, as the gentleman from Oregon suggests, that you have no opposition to it?

Mr. TRUE. Yes; I am willing to admit that.

Mr. McLAUGHLIN. I believe you said last year that the work in your office is really the work of a bureau?

Mr. TRUE. Yes.

Mr. McLAUGHLIN. And that it might properly be called a bureau instead of an office?

Mr. TRUE. That is my understanding of the situation.

Mr. McLAUGHLIN. And there is a notion entertained by some that the size of your salary was influenced somewhat by the fact that your work is called an office and not a bureau. Is there anything in that?

Mr. TRUE. I do not think there is anything in that at all, sir. I report directly to the Secretary, and the business of the office is large and varied.

The CHAIRMAN. What have you to say in relation to the proposed increase of \$200 in the salary of the chief clerk?

Mr. TRUE. That is an increase proposed because of the efficient service of the chief clerk.

Mr. HAWLEY. How long has this man been chief clerk?

Mr. TRUE. In this case it is a woman who is under consideration.

Mr. HAWLEY. This clerk, then; how long has this clerk been employed in this office?

Mr. TRUE. From the very beginning; over 20 years.

Mr. HAWLEY. In this same position?

Mr. TRUE. Not in this same position.

Mr. LAMB. What is her name?

Mr. TRUE. Her name is Mrs. Johnston.

Mr. HAWLEY. How long has she held this position?

Mr. TRUE. She has held the position of chief clerk I think about ten years.

Mr. HAWLEY. Has she had any increase in that time?

Mr. TRUE. There may possibly have been one increase, but the last time she was promoted was July, 1902.

Mr. LAMB. Is she a married lady?

Mr. TRUE. She is a widow.

The CHAIRMAN. Is she required to work overtime now at all, or frequently?

Mr. TRUE. Oh, from time to time.

Mr. HAWLEY. Does she take your place in your absence?

Mr. TRUE. No, sir; we have an assistant director who takes my place. But I might say that the business of our chief clerk's office is quite extensive. It was the understanding when different appropriations were assigned to us, such as the irrigation and drainage items, that we would not make special offices for the general routine business of those investigations, but that as far as possible the general routine business of the entire office would be concentrated in one chief clerk's office, and that has been done.

Mr. HAWLEY. What is the title of the assistant director?

Mr. TRUE. He is called assistant director.

Mr. HAWLEY. I do not see that item.

Mr. TRUE. He is paid from a lump sum.

Mr. McLAUGHLIN. The assistant director and the editor.

The CHAIRMAN. We will turn to that later on. The next increase submitted is that of \$200 for one clerk and proof reader. What have you to say in regard to that?

Mr. TRUE. This man has been a long time in our employ, and the date of his last promotion was July 1, 1902. He is a very faithful and industrious public servant, and I think deserves that amount of promotion.

The CHAIRMAN. I believe that covers the promotions. There are no additions to your statutory roll except by transfer from lump funds.

Mr. HAWLEY. Are all the transfers from lump funds at present salaries?

Mr. TRUE. At the same salaries?

Mr. HAWLEY. Yes.

Mr. TRUE. Yes, sir.

The CHAIRMAN. Turning for the moment to the items under the head of agricultural experiment stations, on page 77, have there been any promotions on your lump-fund salary roll during the past year?

Mr. TRUE. Yes.

The CHAIRMAN. Will you indicate them, beginning at the top? Has your assistant director had his salary advanced?

Mr. TRUE. Yes, sir; his salary was increased from \$3,000 to \$3,500.

The CHAIRMAN. Who is he?

Mr. TRUE. Dr. E. W. Allen.

The CHAIRMAN. Do you know how long he served at a salary of \$3,000?

Mr. TRUE. No; I do not remember exactly. It was several years, but I have not the record.

The CHAIRMAN. You are aware, of course, that the last appropriation act contained a provision requiring an estimate to be made in detail of practically all of the employees in every office and bureau of the department, except the scientists. Is your assistant director a scientist?

Mr. TRUE. Yes.

The CHAIRMAN. Along what line?

Mr. TRUE. His specialty is agricultural chemistry.

The CHAIRMAN. Does he work at it now?

Mr. TRUE. No, sir; not in a strict sense. He is assistant director, and editor of the Experiment Station Record.

The CHAIRMAN. Is his efficiency in that regard in any way enhanced by his efficiency as a scientist?

Mr. TRUE. He could not discharge the duties of his office properly if he had not had scientific training.

The CHAIRMAN. The work is of such a character, in your judgment, that a man without that training—a man, for example, with nothing more than the training of an ordinary newspaper office—could not satisfactorily do the work?

Mr. TRUE. It would be impossible for such a man to do the work satisfactorily.

The CHAIRMAN. And I presume that applies, in your judgment, to all of those who have been left on the lump fund?

Mr. TRUE. Yes.

The CHAIRMAN. Have you any other promotions on that roll except that of your assistant director?

Mr. TRUE. Yes. The man next in order was raised from \$2,500 to \$2,700.

The CHAIRMAN. How about the next man?

Mr. TRUE. The same is true of the next man.

Mr. LAMB. What are the names of these men?

Mr. TRUE. The second man is Mr. Beal, and the third man is Dr. Evans.

The CHAIRMAN. Will you go on down the roll and indicate any other promotions in salary?

Mr. TRUE. My recollection is that the assistant in rural economics was raised from \$1,400 to \$1,600.

Mr. LAMB. What does he do—write about country life?

Mr. TRUE. There is now a very considerable literature of rural economics, and he goes over that and prepares abstracts for the Experiment Station Record. He also has other editorial work connected with the preparation of publications of the office.

The CHAIRMAN. Is that the only other one that you remember to have been promoted?

Mr. TRUE. Those are the only ones that I remember.

The CHAIRMAN. You have on that roll one scientific assistant in library science. Just what is his function?

Mr. TRUE. That is a woman, who deals with the publications from the stations and from abroad as they come in and sorts them out and distributes them to the various editors. She keeps track of the literature, in other words, so that none of it will escape us. That is quite a large and important function, since we receive several thousand periodicals and other documents during the year.

Mr. HAWLEY. Are these periodicals sent to you complimentary, or do you subscribe for them?

Mr. TRUE. Quite a number of them are received in exchange. Others are subscribed to by the general library of the department. We do not subscribe to any, ourselves.

The CHAIRMAN. Do you think that place is very scientifically designated, "one scientific assistant of library science?" I think I know what each one of those words taken by itself means, but it would be pretty hard to guess the meaning of the entire expression.

Mr. TRUE. A trained librarian at the present time has to take a regular course of instruction in a school or college. The studies are grouped with reference to the requirements of library work, and the special business of the librarian in cataloguing, and so forth, is studied.

Mr. HAWLEY. Could this lady take a miscellaneous quantity of books and periodicals assigned to her and catalogue them according to the system of any library?

Mr. TRUE. I think so.

The CHAIRMAN. Returning now to the general expenses paragraph of the appropriation, I think we all understand the purpose of the new language. It was explained in your statement this morning.

Mr. TRUE. I would like to make a statement about that Mr. Chairman, if I may say just a word.

The CHAIRMAN. Certainly.

Mr. TRUE. The language of that item may perhaps need a little amendment. The consideration of the Adams Act itself would show that this language with reference to final appropriation to be made to the stations is somewhat peculiar. After naming the sums that are to be paid while the appropriation is increasing, the act says that thereafter \$30,000 is to be paid to each State and Territory. I

do not understand that it was the intent that \$30,000 should be paid under the Adams Act.

The CHAIRMAN. In addition to the \$15,000 carried by the Hatch Act?

Mr. TRUE. Yes; but that \$15,000 was to be paid to each State and Territory under the Adams Act in addition to the \$15,000 under the Hatch Act.

The CHAIRMAN. That was undoubtedly the intent of Congress.

Mr. TRUE. Yes. Now, I find that the comptroller in making his ruling with reference to the limitation of the appropriation under the Adams Act stated in one place that the Adams Act did not carry any appropriation under the Hatch Act, so that with that \$30,000 in the Adams Act, and no qualifying statement in this new item which we propose, I do not feel sure what the comptroller would rule in case any State or Territory should apply to find out whether they were not entitled to \$30,000 under the Adams Act. I would suggest, therefore, that in addition to the words which we use, a proviso be inserted limiting the amount to each State and Territory to \$15,000.

Mr. HAWLEY. How many States and Territories receive under this Adams Act, 48?

Mr. TRUE. Forty-eight.

The CHAIRMAN. That suggestion will be considered. The next paragraph seems to ask for about \$4,000 more for the administrative expenses connected with the enforcement of these acts than the current law carries. What are the conditions which make that increase necessary?

Mr. TRUE. That is to provide for the general growth of our business relating to the inspection of stations, to the advisory work which we do, and to the publication of the Experiment Station Record and other publications.

The CHAIRMAN. Have you been hampered for lack of funds in that work this year?

Mr. TRUE. We are running it on a very small margin, and the work steadily increases. I think we ought to have a little more to keep the work up in the best way in the future.

The CHAIRMAN. The next paragraph has already been sufficiently discussed for the present. We will pass on to the appropriation for the expenses of the agricultural experiment stations in Alaska, Hawaii, Porto Rico, and the island of Guam, in which there seems to be a slight increase. Is the increase for each of these stations made in compliance with the Adams Act, or have they now gotten all they are entitled to under that act, and are you still asking for more?

Mr. TRUE. The insular stations are not entitled to any appropriations under either the Hatch Act or the Adams Act.

The CHAIRMAN. I know that, but we have been regarding them as entitled to just as much as the stations that were provided for by the Adams Act and the Hatch Act.

Mr. TRUE. Yes, and this increase will simply bring them up to the general level of the other stations. They will get \$30,000 apiece in 1912 in Alaska, Hawaii, and Porto Rico. We do not desire any increase for Guam, the work there being on a limited scale.

The CHAIRMAN. And you strike out the \$5,000 relating solely to the experiments relating to the culture of coffee?

Mr. TRUE. Yes.

The CHAIRMAN. I believe you stated in your statement that this segregation was not regarded as desirable.

Mr. TRUE. Yes.

The CHAIRMAN. In what way did you find it undesirable?

Mr. TRUE. Merely as a precedent. I do not presume that Congress would desire to lay out the work of these experiment stations in detail in the insular possessions, any more than in the States and Territories. If you begin, however, to make special appropriations for special investigations, the habit may grow and be to the decided disadvantage of those institutions.

The CHAIRMAN. I think you are quite right about that, as a general principle.

Mr. TRUE. In this case, before that item was introduced we had already made our plans to respond to the natural demands in Porto Rico for the increase of our coffee experiments. We are in close touch with those people, and we desire to do for them the very best we can with our money, and the putting in of that clause made no material difference in our plans. The only effect of that was that we have to carry that appropriation as a separate appropriation, and the bills have to run against it, and it involves a certain amount of clerical work which in my judgment is unnecessary.

The CHAIRMAN. Will you spend approximately that amount in experiments relating to the culture of coffee this year?

Mr. TRUE. We are spending it this year, and will spend it next year. It may even be increased.

The CHAIRMAN. I have been handed a suggestion to the effect that there be incorporated in this bill, somewhere, a provision which shall make appropriation for agricultural reconnoissance work in Alaska. Do you know whether any one now connected with the work of the department in Alaska has made a suggestion that this work be done?

Mr. TRUE. I have not heard anything of that recently. Some time ago, a year or two ago, there was some proposition of that kind, but I have not heard anything about it lately.

The CHAIRMAN. Would you regard it as desirable to have this work done?

Mr. TRUE. Why, a certain amount of it might be a good thing. We are already doing a considerable amount of that kind of work. To make anything like an exhaustive reconnoissance of Alaska I should say would be a large task, and until the conditions are such that settlers come in in considerable numbers I hardly see the necessity for doing much more than we are doing at present.

The CHAIRMAN. And you think that the appropriation asked for will be sufficient to carry on all the work in Alaska that you regard as necessary at the present time?

Mr. TRUE. That is my judgment.

Mr. HAWLEY. Have you made any investigation to see to what parallel of north latitude you might extend agriculture in Alaska?

Mr. TRUE. In a general way. We are in correspondence with all the stations, and nearly all the people who are engaged at all in growing anything in Alaska, and we send out seeds to them year after year, and we get numerous reports from them.

Mr. HAWLEY. What degree of north latitude is the highest point where agriculture can be properly carried on?

Mr. TRUE. Well, that question put in that way is a little difficult to answer categorically. We have found that certain things can be grown up to and a little beyond the Arctic Circle, but there is no evidence as yet that agriculture on a broad scale can be carried on beyond what we have done at Rampart, which is a little over 65 degrees north. When you get much north of the Arctic Circle, you have conditions such that very few plants will mature, and they must be grown under very careful conditions. Beyond that, I should say that it was the reindeer district. There is one thing, Mr. Chairman, about this island appropriation that I would like to mention before we pass that.

The CHAIRMAN. Yes.

Mr. TRUE. You will perhaps remember the committee decided that the printing for the island stations should be paid out of the general printing fund of the department, and therefore the word "printing" was stricken out. Since then we have received information from the department solicitor to the effect that the island stations constitute a field service and that the comptroller has ruled that in the field service of the department expenses for printing must be paid out of the appropriation for the field service. Now, if that is to be remedied, it would be necessary to put in this item an explicit statement that printing shall be paid for from the general printing fund of the department. I have consulted the Secretary about this, and he asked me to bring the matter to your attention.

The CHAIRMAN. As a matter of fact, what has been your practice this year? Have you had the usual amount of printing done for these stations, and have you paid for that printing out of the departmental fund?

Mr. TRUE. So far we have had very little printing. The printing is coming in now, and we have a number of documents in hand. Those have been returned to us with the statement that the printing can not be paid for out of the general fund of the department; that if they are printed this year it will be necessary to pay for them out of the island appropriation.

The CHAIRMAN. The result of which condition is that until explicit authority is given, either for printing to be paid for out of the funds for the support of these island stations or for the amount to be paid from the general printing fund of the department, you will not be able to do any printing for the stations?

Mr. TRUE. Not quite that. We can go ahead and pay for the printing out of the appropriation for the islands. But our plans of work were made up without reference to that, so that it put a burden on us which we did not expect to have.

The CHAIRMAN. You could pay for the printing, then, without any change in the language, from the funds appropriated for the field stations.

Mr. TRUE. Yes.

The CHAIRMAN. So that any change in the language explicitly placing the cost of the printing on the fund of the department would be to that amount an addition to your appropriation for the island fund.

Mr. TRUE. Yes.

The CHAIRMAN. Have you anything further?

Mr. TRUE. That is all I had in mind with reference to that.

The CHAIRMAN. In the next paragraph you insert some new language and ask that the appropriation be doubled, so that you will be authorized to report upon the organization and progress, not only of the farmers' institutes and agricultural schools, but also of departments of agricultural extension in the several States and Territories. Would you like to say a few words in relation to that?

Mr. TRUE. We have asked to have those words inserted because we find that it is practically impossible in our work to distinguish between the farmers' institutes and the other forms of extension work. The organizations which are carrying on the institutes are carrying on in many cases other forms of what is ordinarily called extension work. At the same time the agricultural colleges are taking up now in a large way what they call extension work. Some of that work consists in holding meetings which are really farmers' institutes. There are other lines of work, such as the running of special railroad trains and the management of demonstration fields, and correspondence courses and a variety of forms of extension work. Now, there is no good reason for separating our work relating to the whole enterprise.

The CHAIRMAN. How much of the \$10,000 increase for which you ask do you think would be accounted for by the work to be done under the authority of this new language?

Mr. TRUE. The increase was not asked for solely because of that work. We desire to meet more fully the demands made on us for work relating to the school, as well.

The CHAIRMAN. How much do you think the work covered by this new language would necessarily add to your expense?

Mr. TRUE. Oh, that in itself would perhaps involve about a quarter of the increase.

The CHAIRMAN. Then what would you expect to do with the remaining three-quarters?

Mr. TRUE. We would expect to enlarge the work which we are already doing.

The CHAIRMAN. By sending more men into the field?

Mr. TRUE. By sending more men into the field. We have now, as I said, four men. Two of them are working with special reference to the agricultural schools. The other two work with reference to the institutes. With that force we can not meet the demands on us for service throughout the country along these lines.

The CHAIRMAN. What do they ask you to do, for example?

Mr. TRUE. Well, they want us to go out and speak to representative bodies of teachers and people who are directly engaged in promoting the introduction of agricultural instruction into the schools and among the farmers.

Mr. LAMB. Do not the States do all that?

Mr. TRUE. The States are taking that up, but it is for that very reason that we are called upon more largely to aid in the matter.

The CHAIRMAN. In a word, the chief function of these four field men is to deliver lectures, is it not?

Mr. TRUE. No, sir; I did not mean to say that. That is one of their functions. They also undertake to prepare publications which will be especially useful in the institute service, and in the schools, and more of that work ought to be done. You understand that there is a large amount of material coming now from the department

itself, and from the experiment stations. That material has in it what is needed by these educational agencies, and what we are trying to do is to put some of that in good form for them to use. Now, if this was an old subject and there was a large pedagogical literature, that would not be altogether necessary, although I think even then some of it might profitably be done, but at present there is no considerable body of literature for the use of these schools, and they want our aid along that line. Then the whole question of what shall be done in the schools is in a fluid state.

Mr. LAMB. Which schools do you speak of, the State schools of agriculture?

Mr. TRUE. No, I am thinking of all sorts of schools.

Mr. LAMB. Public schools?

Mr. TRUE. Public schools, private schools, and special schools.

The CHAIRMAN. You would want to have that confined to the teaching of agriculture, would you not?

Mr. TRUE. Oh, certainly.

The CHAIRMAN. You would not be understood as saying that you are trying to supply literature for all kinds of schools?

Mr. TRUE. No.

The CHAIRMAN. You are trying, as I understand, to supply the demand which is coming up from the country for the introduction of the study of agriculture or the introduction of agricultural teaching in schools of all sorts, and you are trying to tell the people how to go about it; is not that about it?

Mr. TRUE. Yes, sir; that is it. We do not deal with other subjects than agriculture.

The CHAIRMAN. I was afraid that what you said might be subject to misconstruction. Are there any further questions along that line? You ask for an increase of \$5,000 for the appropriation for nutrition investigations. Have you anything to add to what you said in your general statement in regard to that?

Mr. TRUE. That is merely to extend the work. We have, as you will remember, within the last year or two reconstructed the special apparatus known as the respiration calorimeter. We think we have now the best form of apparatus yet devised for work along that particular line.

The CHAIRMAN. Where has that been installed?

Mr. TRUE. It is installed in the basement of the new agricultural building, in the east wing.

The CHAIRMAN. In your opening statement you said you had been carrying on experiments to determine the digestibility of cheese and other things. Were those experiments made upon a human subject?

Mr. TRUE. Yes.

The CHAIRMAN. Did you have any difficulty in finding a man or a woman who was willing to eat anything that you would like to test?

Mr. TRUE. No, sir; we have had no special difficulty in getting subjects.

The CHAIRMAN. Do you generally make use of some employee in the bureau?

Mr. TRUE. That has been so, thus far.

The CHAIRMAN. Suppose you just tell us, as briefly as you can, what the modus operandi is.

Mr. TRUE. The subject is placed in the box of the calorimeter, and remains there during the period of the experiment.

The CHAIRMAN. How does he occupy himself?

Mr. TRUE. In various ways. If we desire to test the effect of food on certain forms of work, we set him at work. We can, for example, put in there a frame of a bicycle, so adjusted that the man can mount the bicycle and run it, and a record will be made of the energy exerted in running that bicycle.

Mr. HAWLEY. Do you gauge the amount of energy that you have to use in turning the wheel?

Mr. TRUE. Yes. We can also set him at work at other occupations, such as hammering, for instance, or digging. He is given a ration the composition of which has been determined. Then we measure and analyze, all the air which goes in, and all the excretory products, so that at the end of the experiment we have an exact record of the energy which has been used in the consumption of the portion of the food which was actually digested. Those experiments are of different lengths. Thus far, in this new calorimeter we have made relatively short experiments, but in the old calorimeter we ran them up to periods of two weeks.

The CHAIRMAN. What do you call a relatively short experiment?

Mr. TRUE. An experiment may last only a few hours, or a single day. We call that a short experiment.

Mr. HAWLEY. Well, do you think that the experiments in that machine would determine the factors in the same way as would occur in the case of a laborer digging post holes out in the open air?

Mr. TRUE. Practically the same. Fresh air is supplied all the time. It is a nice place to live in, they say. I have not been in it myself.

Mr. HAWLEY. That is probably one disadvantage about it.

Mr. LAMB. Doctor, I see that in 1908 you made these investigations at \$5,000 and in 1909 with \$7,000.

Mr. TRUE. In the first instance that you mention we had an appropriation which allowed us simply to remove our calorimeter from Middletown, Conn., to Washington.

Mr. LAMB. I recollect that.

Mr. TRUE. And to finish up the publication of such material as we had on hand. The next year we had an appropriation which simply allowed us to reconstruct the calorimeter, and it is only this past year that we have been making any experiments with the new calorimeter.

The CHAIRMAN. In what way would you extend the work if this additional \$5,000 was appropriated?

Mr. TRUE. We will endeavor to run the calorimeter more days, and thus accumulate a larger amount of material. At the same time we want to extend our more practical work, which evidently is meeting with a popular response, because the popular bulletins that we issue on these food subjects have a wider distribution than almost any of the department publications. I believe we stand at the top of the list this year.

Mr. LAMB. That is prompted by curiosity more than anything else, is it not?

Mr. TRUE. I think not. I have undertaken to make some inquiries about that in different parts of the country as I have been through the country this past year, and I have found a considerable number of

housewives with whom I happened to come in contact who have received our bulletins and made use of them practically in the kitchen.

Mr. HAWLEY. What practical use do they make of them?

Mr. TRUE. In cooking the things which we advise them to cook. The bulletin that attracted the most attention this year was that on the economical uses of meat. That showed a variety of preparations in which cheaper cuts of meats are used. Some of those were probably known to a good many housewives in this country already. Others I am sure were not.

Mr. HAWLEY. Had you tried out all those recipes in your calorimeter?

Mr. TRUE. No, sir.

Mr. HAWLEY. How many of them had you tried out?

Mr. TRUE. I do not remember that any of those recipes themselves had been tried out in the calorimeter. We have not been able with the calorimeter to go into as much detail as that yet; but what we did with those was to have all those recipes carefully gone over by a woman who had been a teacher of domestic science, and understood the practical phases of it as well as the scientific. She made sure that the recipes would work practically. We also determined what would be their equivalent in scientific terms, as a portion of a ration.

Mr. LAMB. Did you try the vegetable diet alone?

Mr. TRUE. Yes, sir; we have tried the effect of the vegetable diet to a certain extent, and we are not believers in an exclusively vegetarian diet. It is possible to make up a vegetarian diet which will theoretically supply enough nutriment to the body.

Mr. LAMB. We know from practice that a vegetable diet will give all the strength and energy you want. I know a man who has lived for 40 years on a vegetable diet alone.

Mr. TRUE. Yes; that is true in individual cases, but as a general proposition, so far the evidence is not in favor of an exclusively vegetarian diet. I do not care to take the time of the committee, but there is one thing that must be taken into consideration in considering diet from a scientific standpoint. It is not simply the question of digestibility of the food, but the question of ease of digestion and the amount of energy that the body has to exert to digest a certain diet. Now, we find that a purely vegetarian diet, made up of a sufficient amount of food, makes it necessary for the body itself to utilize more force in its digestion; that in a rough way may be taken as the statement.

Mr. BEALL. Have these experiments in regard to the relative digestibility of cheese been conducted in your department?

Mr. TRUE. Yes; we are preparing that matter for publication now.

Mr. BEALL. Are you preparing to upset the belief on that subject?

Mr. TRUE. We hope to get it out of the heads of the people that cheese necessarily leads to digestive troubles, constipation, and so forth. A great many people will eat only a little bit of cheese because they are afraid it will disturb their stomachs. One difficulty is that we ordinarily eat cheese after we have eaten enough already. If you make a diet, on the other hand, in which cheese takes the place of other foods, you can put in a considerable amount of cheese.

Mr. HAUGEN. Is not this on the same line with the experiments made by Dr. Wiley?

Mr. TRUE. No, sir; because Dr. Wiley deals with adulterated foods. We do not go into that field. We try to give our subjects good food.

The CHAIRMAN. In regard to your irrigation investigations, for which you ask for an increase of something over \$12,000, the statement is made that it is needed in order to give advice and assistance to settlers in newly irrigated regions. Have you had demands from that quarter which you have not been able to meet?

Mr. TRUE. Yes, sir, to a very large extent. I tried to explain in my written statement briefly the condition of things in the arid regions or irrigated regions.

The CHAIRMAN. I think we understand pretty well what that situation is, and it is merely a question whether with your present appropriation you are able to meet the demands upon you.

Mr. TRUE. No, sir; we are not.

The CHAIRMAN. I presume the same reasoning would apply to the increase asked for under the head of drainage investigations?

Mr. TRUE. Yes.

Mr. HAWLEY. Why do you propose to strike out the last two and a half lines of the provision for drainage investigations?

Mr. TRUE. I understood that to be a special matter which applied to last year only.

The CHAIRMAN. I do not think it was the intention of Congress to have that report made every year, and therefore that language was properly stricken out.

Mr. TRUE. I may say that we will probably include in our annual report a supplementary statement which will continue the report which we have already made.

Mr. LAMB. Are you in correspondence with these drainage people of the South who want all the swamp lands of the South drained? They are having conventions down in my country, and they invited me down there.

Mr. TRUE. Yes. The chief engineer was in Richmond yesterday or the day before addressing a body on the subject.

Mr. HOWELL. You carry on your drainage investigations in collaboration with the States, do you not?

Mr. TRUE. Yes.

Mr. HOWELL. And what is the general plan of assisting the States in this respect?

Mr. TRUE. The States that have cooperated as a rule have made the State appropriations under a cooperative law.

Mr. HOWELL. The department usually contributes about as much as the State?

Mr. TRUE. The department usually contributes about as much as the State.

Mr. HOWELL. Is there any regulation that requires that to be done?

Mr. TRUE. No, sir; and I do not think it would be wise to have such a regulation. We put in what money is necessary to make an efficient investigation.

Mr. HOWELL. Do you find that the States interested in irrigation are making larger appropriations than heretofore?

Mr. TRUE. Yes; the appropriations have increased.

Mr. HOWELL. There is a great deal of interest being manifested in this subject?

Mr. TRUE. Yes; there is no subject in any line of our work in which there is more interest manifested than in irrigation, because of the large influx of people into that region who know nothing about irrigation, and who must be made contented, or else there will be serious trouble.

Mr. HOWELL. You are asking for about \$12,000 more this year?

Mr. TRUE. About \$12,000.

The CHAIRMAN. Are there any further questions on the part of any member of the committee?

Mr. STANLEY. Do you do much drainage work where there is no irrigation, or simply where it is overflowed land?

Mr. TRUE. Our drainage investigations are conducted throughout the Union. The larger part of our work in drainage is done in the humid regions, although a considerable amount is done in the irrigated regions.

The CHAIRMAN. If there are no further questions, and Dr. True has nothing further to present to the committee, we are very much obliged to you, Doctor, and we will pass to the consideration of the appropriation for public roads. Mr. Page, the director of that office is present, and we will ask him to make whatever statement he would like to submit to the committee, in a general way first, and then we will take up the details of the estimates.

AFTERNOON SESSION (CONTINUED).

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
December 16, 1910.

**STATEMENT OF LOGAN W. PAGE, DIRECTOR OF PUBLIC ROADS,
DEPARTMENT OF AGRICULTURE.**

Mr. PAGE. Mr. Chairman, you very courteously gave me the opportunity of preparing a paper on some work that I have been recently doing, but circumstances made it impossible for me to prepare that paper. I was interrupted. But I would like to present to the committee an account of some work that I have been doing during the past year. A little over a year ago I discovered that it was practical to mix petroleum oil with wet Portland cement, and that the oil at once emulsified and disseminated evenly throughout the whole mass, and this has opened a very interesting field. Up to the present time there have been constructed according to this new method about 400 feet of street in New York City, and about 300 feet in Washington, and recently a vault about 105 feet long by 18 feet wide in the Treasury Department, and at present they are putting down a number of basement floors in the Treasury with this material. Besides, we have put down two bridge surfaces at Ridgewood, N. J., and the United States Navy Department is at present experimenting with this material to see if they can not substitute it for wood for the decks of battleships. The point of importance about this material is that it seems absolutely waterproof. Water acts just like it would on a duck's back, you might say; it balls up like quicksilver and remains in little globules until it evaporates.

This Treasury vault is right under the parking on Executive Avenue, and they put a high curb all around it, about 18 inches high, so as to be able to plant grass. The contractor yesterday told me that for about two weeks 3 or 4 inches of water had stood on the roof of this vault, and not a drop had passed through. There are a number of fields in which this can be used. For instance, there is no reason why it should not be used for the construction of buildings, not only for the interior parts, such as floors, but for the construction of the building itself. A building like this, you see, has a concrete floor. This floor had to be painted, as you see, because the cement will powder off, and it makes a disagreeable dirt. With the new material it will not powder to any material extent, and the outside of houses can be built equally well with it by simply stretching expanded metal—metal lathing, as it is called—and plastering right onto that a cement plaster similar to this [exhibiting sample], and plastering the roof as well as the sides. I believe it will make a waterproof house, and that it will probably be cheaper than wood, and might in a measure help to solve the problem of conserving our forests.

The CHAIRMAN. When you used that cement for that purpose, for the sides or the roof of a house, what would you put into it besides the oil and water; would you put in sand?

Mr. PAGE. I would put in sand.

The CHAIRMAN. What proportion of sand to cement is the best?

Mr. PAGE. The best possible proportion is enough cement to exactly fill the voids in the sand. Now, that can be determined very closely. You can take a glass and fill it full of sand, and another glass of the same size and fill it full of water, and just pour in enough water to fill up the voids in the sand, and then examine the glass with the water in it and see just about what proportion you have poured out. It is generally, roughly speaking, about 41 per cent, which would make it 1 of cement to 2½ of sand. That is about the proper mixture; and the same is true in making concrete. You take a mortar like that, and in using a rock aggregate you should use just enough mortar to fill the voids in the rock, and then you have the densest possible mixture and the minimum amount of cement. It is consequently the most economical and strongest mixture. Such a mixture would stand the greatest load.

The CHAIRMAN. Have you made any experiments with ordinary cement, "natural cement" as I believe they call it?

Mr. PAGE. What is known as Rosendale cement is made by the grinding of rock which contains just about the proper proportions of alumina, silica and lime, by simply burning the rock to a clinker and grinding it. They call that natural or Rosendale cement. It is being replaced to a considerable extent by Portland cement, in which the ideal proportions of those materials are mixed together. Then it is ground and thoroughly mixed, burned to a clinker, and reground, and that is called Portland cement.

The CHAIRMAN. The natural cement is much cheaper because the process of manufacture is simpler?

Mr. PAGE. It is simpler.

The CHAIRMAN. And the plant is much less expensive?

Mr. PAGE. But it is less reliable.

The CHAIRMAN. I wondered if you had made any experiments on that?

Mr. PAGE. It will work perfectly with the natural cement.

Mr. LAMB. What is the difference in cost between building with that cement and with lime and sand?

Mr. PAGE. The oil would add very little to the cost as it is only 3 or 4 to 5 cents a gallon, and you put in 10 per cent of the weight of the cement in oil, and that makes almost no difference.

Mr. LAMB. It is stronger?

Mr. PAGE. Yes; cement mortar is infinitely stronger than lime mortar. On my six-months' test with a mortar like that I got 2,400 pounds to the square inch of compression. You could safely put it in the base of the Washington Monument.

Mr. HOWELL. What is the difference in making that natural cement and the manufactured cement?

Mr. PAGE. What is the difference in cost?

Mr. HOWELL. Yes.

Mr. PAGE. It varies. Natural cement last year went down to 60 cents a barrel, and they claimed that they had lost money at that price. They have gotten the Portland cement down so cheap now that it is

replacing the natural cement, because it is more reliable. If you are quarrying rock the proportions of the ingredients, lime, silica, and alumina, vary in the natural rock, so that you get a cement that is very strong on one run, and much weaker on another.

Mr. HOWELL. In what sections of the country do they manufacture this natural cement?

Mr. PAGE. There is a good deal of it made in the eastern part of New York.

Mr. HOWELL. I never saw any of it in the West.

Mr. PAGE. No, I do not think there is any of it there.

The CHAIRMAN. Some of it has been made in Kansas.

Mr. PAGE. Natural cement?

The CHAIRMAN. Yes.

Mr. McLAUGHLIN. Why do they call it natural cement?

Mr. PAGE. It is natural when it is made out of the rock, burned and ground.

Mr. McLAUGHLIN. A large part of the cement is made that way now, is it not?

Mr. PAGE. No; for the Portland cement they take the limestone and have it carefully analyzed to determine the ingredients, and then they add to that the proper amount of silica and alumina to make what is considered the ideal mixture, and then it is burned to a clinker, and ground to a fine powder, so that it is always the same.

Mr. McLAUGHLIN. In mixing this cement in which you mix petroleum, do you mix it with petroleum oil instead of water?

Mr. PAGE. We use both.

Mr. McLAUGHLIN. How do you mix it?

Mr. PAGE. In a mixing machine. Mr. Parsons, the contractor on this Treasury work, told me he actually mixed concrete quicker when the oil was with it than when it was out of the ordinary mixture.

Mr. HAUGEN. How much oil and how much water to a yard of concrete?

Mr. PAGE. How much water?

Mr. HAUGEN. Yes.

Mr. PAGE. I should say, approximately, about 25 per cent by weight.

Mr. HAUGEN. Twenty-five per cent of what?

Mr. PAGE. Of the weight of the mortar.

Mr. HAUGEN. Of water and oil combined?

Mr. PAGE. How much oil do we put in?

Mr. HAUGEN. How much oil to how much water?

Mr. PAGE. They add water in just the usual—

Mr. HAUGEN. Not how much do you add, but how much of each?

Mr. PAGE. In making concrete some engineers prefer making it wetter than others. That is, they add more water and make it much more viscous, and they simply add water until they get it to the consistency that they want it, and they generally determine that by so much to the weight put in. You add water until it is wet, and then add the oil.

Mr. HAUGEN. What I want to get at is how much oil you use?

Mr. PAGE. Ten to 15 per cent of the weight of the cement used.

Mr. HAUGEN. Fifteen per cent of the cement used?

Mr. PAGE. Yes; by weight.

Mr. HOWELL. Is that in addition to the 25 per cent of water used?

Mr. PAGE. Yes. The reason I take the weight of the cement in determining the proportions is that frequently we have mixtures of only straight cement and water, so that I take the per cent by weight of the cement used, because otherwise it would be confusing to anyone in making the concrete.

Mr. HAUGEN. That is, for every 100 pounds of cement you use 15 pounds of oil?

Mr. PAGE. Yes; 15 pounds of oil for every 100 pounds of cement.

Mr. HAUGEN. What is the expense of the petroleum used?

Mr. PAGE. We have gotten the best results with a nonvolatile oil; in other words, that is the oil residuum after the kerosene oil and the gasoline have been taken off.

Mr. HAUGEN. How expensive is that?

Mr. PAGE. Oh, from 4 to 5 cents a gallon.

Mr. HAUGEN. From 4 to 5 cents a gallon?

Mr. PAGE. Yes. That is a pure white Portland cement [indicating sample], with a pure white oil added to it, and a white sand.

Mr. McLAUGHLIN. Is it inflammable?

Mr. PAGE. Oh, no; absolutely not inflammable. We use an oil the flashing point of which is above 350°.

Mr. McLAUGHLIN. But suppose a flame comes directly in contact with it?

Mr. PAGE. You may strike a match and see if you can light that. You could put it in the fire and not burn it.

Mr. HOWELL. What would be the effect on it in a conflagration where there is an enormous heat? Would that affect it?

Mr. PAGE. All the burning portion is taken out of that oil which we use and the material is as near fireproof as a material can be made.

Mr. McLAUGHLIN. I understood you to say that the advantage of this was that it was hard and would not rub off?

Mr. PAGE. There is a little corner of that sample where it fell and broke off. You take the top of it, and I do not think you will find it rubs off very easily.

Mr. HAUGEN. Did you ever build a large water tank of this?

Mr. PAGE. Yes; I built quite a large water tank in the corner of my laboratory, and it does not leak a drop.

Mr. HAUGEN. How much oil did you use with this?

Mr. PAGE. Ten per cent of oil.

Mr. HAUGEN. To what?

Mr. PAGE. To the weight of the cement.

Mr. HAUGEN. And then how much sand to the cement?

Mr. PAGE. I used 2 parts sand and 4 parts broken stone.

Mr. HAUGEN. Reenforced?

Mr. PAGE. Yes; reenforced with steel.

Mr. HAUGEN. And then how much cement?

Mr. PAGE. One part cement, 2 parts sand, and 4 parts broken stone.

Mr. HAUGEN. That is one-sixth?

Mr. PAGE. Yes.

Mr. HAUGEN. All through?

Mr. PAGE. Yes; all through.

Mr. HAUGEN. Did you not brace it inside?

Mr. PAGE. We just troweled it. After we took the forms off we smoothed it over and gave it a sort of a paint coat. In the road work

which I have been experimenting on with this I have tried to use oil having an asphaltic base, so that I could combine the toughness and plasticity of asphalt with the high compressive strength of Portland cement. I am in hopes we have got a road that will give good service.

The CHAIRMAN. What effect does extreme heat or cold have on such a road?

Mr. PAGE. Up to the present time we have noticed no changes at all. That is one of the important things. Portland cement concrete probably would make the best road we could have for standing modern traffic, but for the fact that it fails in large sheets if exposed to atmospheric conditions. It shrinks and cracks, and it is very brittle. It chips off on the edges of these cracks and soon it makes a rut, and traffic pounds on it: but I am in great hopes that with the addition of oil we can prevent that cracking; but only time can tell.

Mr. McLAUGHLIN. One trouble I have heard about is, in using cement for plastering or using it with steel laths such as you spoke of awhile ago, that the moisture in the concrete rusts the laths, and they break and it falls in.

Mr. PAGE. It will not if oil is in it.

Mr. McLAUGHLIN. You think that will overcome that trouble, do you?

Mr. PAGE. Yes, I think so. Of course that is only a thought, though. I am making experiments to determine that.

The CHAIRMAN. Have you experimented with a larger percentage of oil than 15 per cent?

Mr. PAGE. I have gone up as high as 40 per cent.

The CHAIRMAN. Or with a smaller per cent?

Mr. PAGE. I have experimented from about 2½ per cent up to 40 per cent.

The CHAIRMAN. And you get the best results at 15 per cent?

Mr. PAGE. At from 10 to 15 per cent. I find that for waterproofing 10 per cent is all that is necessary. We used 10 per cent in the Treasury vault. I have used 15 per cent in some instances, because I thought a little more of the asphalt going in would be beneficial.

Mr. HAUGEN. What is your object in using oil in the construction of cement pavement?

Mr. PAGE. To get the toughness and plasticity of the asphalt that is in the asphaltic base oil; and combined with the high compressive strength of the cement we get, it seems to me an ideal mixture that will not crack. Cement is too brittle for traffic blows, and we know the blended proposition is useful in streets; it has been used for years with the greatest success; but one trouble with asphalt is that it is soft and it has a tendency to hammer down. Now, this cement would just meet that condition.

Mr. HAUGEN. Is that cement used to any large extent in building construction?

Mr. PAGE. Only for foundations; because, as I said before, when cement is exposed to the atmospheric conditions which exist in a street the part next to the ground remaining at one temperature, and the surface varying from zero up to 140°, the concrete will crack.

Mr. HAUGEN. In our section of the country it is used to a large extent for paving of streets and alleys. That is cement.

Mr. PAGE. You have not such great weather changes there.

Mr. HAUGEN. Yes, we have; that is in northern Iowa.

Mr. PAGE. Yes; I remember there have been some streets laid there, but you will find that it will crack all to pieces.

Mr. HAUGEN. This is laid in large blocks, and spaces are left open for expansion and contraction.

Mr. PAGE. If you will notice the roadway from the end of Fourteenth Street to the Long Bridge, that is constructed with the densest mixture of cement concrete, and within two years there are cracks that wide [indicating] running longitudinally. They put that pavement down in 40-foot blocks with inch expansion joints, and the cracks will go right through them.

Mr. HAUGEN. Through the whole block?

Mr. PAGE. Through the whole block.

The CHAIRMAN. Would better results have been obtained if they had made the blocks, say, 3 feet square?

Mr. PAGE. Yes; but then you would have another trouble. One of the great disadvantages experienced with concrete is its brittleness. On the edges, where wheels go over, it would spall wearing it continuously until it made a regular gutter on the street.

Mr. HAUGEN. Not if this was reenforced by iron, would it?

Mr. PAGE. I think it is not the best engineering practice to reinforce a street with steel, for this reason, that the idea in reenforcing concrete is that the steel will take care of the tensile stresses and the concrete will withstand the compression. In tension concrete has a very low resistance indeed. Now, in a span like a flat arch, where concrete is held at the two sides, and the load is put in the middle, tensile stresses will develop. Now, if you embed in your concrete steel rods you will get the benefit of that high tensile strength that the steel has, and the compressive resistance of the concrete. That is the whole idea. There have been people who have patented concrete pavements made with steel in them, but I do not believe steel adds to their effectiveness.

Mr. HAUGEN. I supposed that the iron was put in to keep it from cracking in there.

Mr. PAGE. I do not believe it will do it.

Mr. HAUGEN. It will not do it?

Mr. PAGE. No, sir.

Mr. HAUGEN. Would the iron break?

Mr. PAGE. The iron would not break, but probably the concrete would slip from around it, because the enormous strain set up by shrinkage would break any combination; that is the strain that comes on the surface by reason of the temperature changing from one hundred and forty degrees above zero to a temperature below zero.

Mr. McLAUGHLIN. How will this cement which was made with oil take paint?

Mr. PAGE. Perfectly. You can paint right over it. But you can make the cement any color you want.

Mr. HAUGEN. You have constructed a number of bridges?

Mr. PAGE. Yes.

Mr. HAUGEN. What is your idea about an arch or a flat top?

Mr. PAGE. Just exactly what I have said with regard to this.

Mr. HAUGEN. Do you recommend a flat top?

Mr. PAGE. I think it depends on how much room you have.

Mr. HAUGEN. How much what?

Mr. PAGE. If you have very high abutments to your bridge, and have plenty of room to put it up in the air so that everyone does not have to climb over it, I would build an arch bridge.

Mr. HAUGEN. Which is the most practical and the strongest bridge?

Mr. PAGE. You can make either one just as strong as the other, but the selection of the type is a question of economy. We figure up the strains and stresses liable to come on the bridge, and if it is a flat arch put enough steel in, with a factor of safety, to take any load that may go over it. Semicircular concrete arch bridges are frequently built without reinforcement.

Mr. HAUGEN. Yes, but I built one several years ago, and it fell down.

Mr. PAGE. You take this great Rock Creek Bridge; there is not a piece of steel in it.

Mr. HAUGEN. They do reenforce with iron in those large bridges, do they not?

Mr. PAGE. In many cases they do.

Mr. HAUGEN. What have you to say as to these large buildings they are putting up with concrete?

Mr. PAGE. The floors are reenforced, because the concrete there comes in tension at the bottom.

Mr. HAUGEN. How about the side walls?

Mr. PAGE. If you have any lateral strain, horizontal strain——

Mr. HAUGEN. Say in an 8 or 10 story building?

Mr. PAGE. They reenforce the columns to enable them to withstand side thrusts rather than to take the overload, as any building might be subjected to wind pressure, or an earthquake.

Mr. HAUGEN. I thought the idea was to hold the cement together and keep it from cracking.

Mr. PAGE. The cement will hold itself together, if it is made right.

Mr. HAUGEN. Possibly, with this process.

Mr. PAGE. No; I mean any good concrete. Take the Connecticut Avenue Bridge; there is no steel in that, and it is not cracking. That is one of the biggest bridges in the world.

Mr. HAUGEN. Is that due to the mixing of the cement, or the construction?

Mr. PAGE. Properly mixed, properly constructed, and properly designed to take the load.

Mr. HAUGEN. When you say properly mixed, what do you mean by that; in proper proportions?

Mr. PAGE. The proper proportions are used and the materials thoroughly mixed with each other. If you make an arch bridge that is not a circular arch, then you should reenforce it, because tensile stresses will develop and it is very apt to crack and break through.

Mr. COCKS. I understand all the large contractors working with concrete employ a chemist, and each shipment of concrete is tested in the laboratory.

Mr. PAGE. Yes.

Mr. COCKS. And the formula is changed from time to time.

Mr. PAGE. Yes; they draw up their specifications for it and analyze, so far as it is practical to do so, every run of cement. All the big factories do it. And then they make little briquets, and test it in tension.

Mr. HAUGEN. The manufacturers of cement test it?

Mr. PAGE. I say, they have chemists.

Mr. COCKS. But that would not do any good, even then, unless the contractor tested each shipment that he got, because he wants to keep track of the variations, as I understand it.

Mr. PAGE. Precisely.

Mr. COCKS. Possibly the greatest cause of trouble in this cement was because it was improperly proportioned, improperly mixed?

Mr. PAGE. It is improperly burned sometimes.

Mr. COCKS. Yes.

Mr. PAGE. There were some cement sidewalks laid in the District of Columbia several years ago, and six weeks after they were laid they disintegrated.

Mr. COCKS. In our country, in those real estate developments we have had pavements laid that buckled right up, just lifted right up, and they were put down in blocks only 2½ feet long. They would raise right up. Two pieces where they came together like that just bulged up that way [indicating], and then of course somebody came along and hit them and they went all to pieces. Of course those pavements were laid very thin and quickly, and they were not Portland cement. The blocks were not over 2 feet long, and there were cracks down in between, spaces left to take care of that expansion and contraction, but they did not.

Mr. HAUGEN. And that was due either to intense heat or to the cold.

Mr. COCKS. Exactly.

Mr. PAGE. Yes.

Mr. HAUGEN. That was not proper construction.

Mr. COCKS. They claimed it was.

The CHAIRMAN. Where is this pavement, in this city?

Mr. PAGE. On Meridian Street, between Fourteenth and Sixteenth Streets.

Mr. HAWLEY. Where is that pavement that you built in New York?

Mr. PAGE. It is in the Borough of Richmond.

Mr. HAWLEY. Does it have considerable heavy traffic over it?

Mr. PAGE. I think so. I was only there once.

Mr. HAWLEY. Have you examined that to see if it is all right?

Mr. PAGE. Every time one of our engineers has occasion to go over to New York I make him go over and look at this, and I get reports from them about once a month.

Mr. HAWLEY. Is it grinding off?

Mr. PAGE. Very little.

The CHAIRMAN. How long has this street been down in Washington?

Mr. PAGE. It was laid last May.

Mr. COCKS. Mr. Page, I have tried this mixture of yours on the roof of a building lately.

Mr. PAGE. Did you?

Mr. COCKS. Yes; and it has been there three or four months and it is entirely satisfactory so far, and is entirely waterproof. It sheds water absolutely.

Mr. PAGE. That is first rate. I have been trying to get somebody to try it for roofing. I am very glad you did.

The CHAIRMAN. Have you patented or applied for a patent for this cement composition?

Mr. PAGE. Yes.

The CHAIRMAN. You have done that in the name of the public?

Mr. PAGE. In the name of the public; yes, sir.

The CHAIRMAN. Have you any idea what the patent might have been sold for, if you had not done that?

Mr. PAGE. If I owned it now, I would not sell it for a million.

The CHAIRMAN. I thought it was only fair to Mr. Page that this statement should go in the record. Is there anything further in connection with this matter that you would like to call to our attention?

Mr. PAGE. This cement also makes a very good paint, and particularly for brickwork, and would keep the dampness out.

The CHAIRMAN. It can be made thin enough for a paint and still have these waterproofing qualities?

Mr. PAGE. Yes.

Mr. McLAUGHLIN. You thin it with what, water?

Mr. PAGE. Just mix the water and oil in with it.

Mr. McLAUGHLIN. You mean you mix the oil in with the paint?

Mr. PAGE. Just take ordinary Portland cement and add enough water to make it the consistency of paint, and then add the oil to that, and the oil disappears in the mixture, and then you use it for a paint.

The CHAIRMAN. Could you apply that paste to wood?

Mr. PAGE. I have not tried.

The CHAIRMAN. Would it adhere?

Mr. PAGE. I should rather doubt it, but I do not know.

The CHAIRMAN. There would probably be too much expansion and contraction?

Mr. PAGE. Probably.

The CHAIRMAN. Is there anything further you would like to present to the committee in a general way?

Mr. PAGE. No, sir; I do not think so.

The CHAIRMAN. Then we will take up the details of the estimates. It has been the practice of the committee to discuss any question relating to an increase in the salary of the head of an office or bureau with the Secretary rather than with the man directly interested; but if you care to offer any suggestions in connection with this, or any objections, we would be glad to hear from you.

Mr. PAGE. Mr. Chairman, I am not as modest as some of the members of the department. I really think my salary is a joke, almost. In fact, I am ashamed to tell anybody what it is, on the outside. I think for a man with the duties and responsibilities that I have, \$3,000 is absurd. I was offered \$10,000 to take charge of the road work of one county, and I think that I ought to have more.

The CHAIRMAN. You do not think you would have any particular difficulty in making both ends meet if you should lose your present position?

Mr. PAGE. I have not the slightest. In fact, I might do very much better financially. I might say in that connection that I have just lost a most valuable assistant, Dr. Cushman. He was a man who came to the department the year after I did, and the appropriation I got was so small that at that time he worked for a year and a half for nothing, and since then I have been seeing to it that he got

the same salary that I get; but this year he decided that it was his duty to look a little bit more to his private interest, and so he has left a \$3,000 salary with the Government, and he is getting \$32,000 a year.

Mr. HAWLEY. \$32,000?

Mr. PAGE. \$32,000 to start with, and he will probably get more.

The CHAIRMAN. He is the man that carried on that pure iron examination, is he not?

Mr. PAGE. Yes; he is a man who conducted the most valuable research work. He stated last year to the committee how he discovered what the actual rusting of iron is due to, and he has found out how to inhibit the rust in iron by the proper kind of paint, and he found out how to make iron very much purer and consequently it will not rust so much. The American Rolling Mills Co. alone gives him \$10,000 to conduct research for them.

Mr. HAUGEN. In his report I believe he stated that that is largely due to the methods employed in the manufacture of the iron.

Mr. PAGE. Yes; he is making very pure iron now. I think they can turn it out 99.99 per cent iron.

Mr. HAUGEN. Has he discovered any new process in the manufacture of iron that would increase the purity?

Mr. PAGE. Yes; that is it. They purify it. They did not believe it was possible before.

The CHAIRMAN. Would you like to make any comment upon the request for an increase of \$200 in the salary of your chief clerk?

Mr. PAGE. My chief clerk is a man who has given most excellent service, and he has been in the department for some years—I do not remember just how many—and he certainly deserves it.

The CHAIRMAN. Does he act as director in your absence?

Mr. PAGE. No, sir.

The CHAIRMAN. Who does?

Mr. PAGE. The assistant director did, when I had one. Dr. Cushman has left now. He would act, and in his absence the chief engineer, and the chief of road management, in the order named.

The CHAIRMAN. Your assistant director is employed under the lump fund?

Mr. PAGE. Yes.

The CHAIRMAN. How long has your chief clerk been employed at his present salary?

Mr. PAGE. Five years, 2½ years in my office and 2½ years in the Secretary's office under the appointment clerk, before coming with me.

The CHAIRMAN. You ask in all for new places on your statutory roll to the amount of \$6,340?

Mr. PAGE. Yes. I think some of those are transfers, largely.

The CHAIRMAN. No; that is in addition to the transfers.

Mr. PAGE. Oh, yes.

The CHAIRMAN. Have you found it difficult to keep up with your work with your present force?

Mr. PAGE. Very difficult. I can not do it, as a matter of fact.

The CHAIRMAN. What do you do; let it fall behind, or do you work over-time?

Mr. PAGE. Just simply decline to do more than I can.

The CHAIRMAN. For instance, what are you obliged to decline to do that you think you ought to do and that you would do if you had additional force?

Mr. PAGE. Well, for instance, a certain locality asks us to show them how to build a certain kind of road, but we are about two months behind in our engagements, and we tell them we can not do it, or we tell them if they can wait 6 or 8 months we can do it.

The CHAIRMAN. Does that apply to your clerical force carried on the statutory roll?

Mr. PAGE. You are referring now to the clerical force?

The CHAIRMAN. Yes; on the statutory roll.

Mr. PAGE. Oh, no; the clerical force keeps up with the field force; but in this increase it will be absolutely necessary to make additions proportionate to the increase requested.

The CHAIRMAN. So that the increase asked for in your office force is predicated upon the increase you ask for for your miscellaneous expense being granted?

Mr. PAGE. Yes. I have prepared, Mr. Chairman, tables here giving all the increases and explaining briefly the exact reasons for every one. That might be of assistance to you in looking over this.

The CHAIRMAN. Yes; I would be glad to have you leave that with the clerk of the committee. Passing to the paragraphs under the head of general expenses on page 81, it seems that you ask for the insertion of some new language at the bottom of the proviso in your first paragraph, "except such as may be necessary for field experimental work as hereinafter provided for."

That should be considered, then, in connection with the paragraph at the bottom of that page, as follows:

For conducting field experiments and various methods of road construction and maintenance, and investigations concerning various road materials and preparations; for investigating and developing equipment intended for the preparation and application of bituminous and other binders; for the purchase of materials and equipment; for the employment of assistants and labor; for the rental and erection of buildings; such experimental work to be confined as nearly as possible to one point during the fiscal year, \$10,000.

Mr. PAGE. Yes, sir.

The CHAIRMAN. You will remember, Mr. Page, that you formerly had authority for the purchase of road-making machinery?

Mr. PAGE. Yes.

The CHAIRMAN. And that authority was withdrawn two years ago by an act of Congress, and last year you reported to the committee that in your opinion it had been an advantage rather than a disadvantage to the work of your office?

Mr. PAGE. Yes.

The CHAIRMAN. It looks as if the language you have asked us to insert here now would be easily broad enough to permit you to buy road machinery?

Mr. PAGE. Only for this specific work. It reads "as hereinafter provided for." That is the reason that first alteration was made.

The CHAIRMAN. Well, I was questioning in my mind as to the extent of that authority.

Mr. PAGE. No, sir; this is on the specific road. What I want to do is this: To make arrangements with the Maryland and District of Columbia authorities for a continuous stretch of road leading out of Washington, so that I can make actual experiments on all of these different kinds of materials that are used as artificial binders now, and that I may maintain this stretch of road and keep accurate cost

data. As it is now, it is the most difficult thing. We get letter after letter, asking how much it costs to maintain a road of a certain material, and how much it costs to lay it. Now, unless we can get them in actual competition that way, and keep accurate cost data, we can not accurately answer those questions. And another thing, from an educational standpoint it would be a very good thing. There are a great many road engineers and road builders that come to Washington every year, and they naturally gravitate to the road office, and they want to see different types of road, different types of construction, different types of treatment. Well, I only have to show them what we have here, which is very small in number, and with a road like that to take them out and show them just how this particular kind of material and particular kind of construction looks, and explain to them exactly how it is done, and then show them exactly what it costs, and, most important of all, how to maintain it, is what I want to do.

The CHAIRMAN. Would it not be possible to carry on those experiments upon Government reservations or parks somewhere near the city in which the Government is obliged to build and maintain the roads anyway? Consider Rock Creek Park, for example; there are many miles of roads there. Would it not be possible to do this there; to conduct your experiments along those roads?

Mr. PAGE. I do not think that would be a good example, at all. I have picked out as the best road to try this on the Baltimore road, because it gets more traffic. We want a road with a very heavy traffic, and the park roads get nothing but a little light pleasure vehicle traffic, slow automobile traffic, and it would not be any test at all. Otherwise it would be very much better if we could get it on a Government reservation.

Mr. HAUGEN. Would not the city itself be the proper place? There you would get the heavy traffic.

Mr. PAGE. You see, it would be working into different departments and mixing things up.

Mr. COCKS. You want to get actual rural road conditions?

Mr. PAGE. Rural road conditions; and I think the Baltimore pike is a typical example of a rural road.

Mr. COCKS. And another thing, the vehicles do not go fast enough here to give you any idea?

Mr. PAGE. Nothing like they go out in the country where there are no policemen.

Mr. HAWLEY. Would there be considerable farm traffic over this road?

Mr. PAGE. Considerable farm traffic, and a great deal of automobile traffic.

Mr. HAUGEN. It looks to me like a good way of getting over that experimental business in the States, and all that. I see it all, because I have been through it. It looks to me like a good way of giving the object lesson without going to the field to give it.

Mr. PAGE. You will find that the officials in Texas and California and all these other places would rather object to coming to Washington.

The CHAIRMAN. How much road would you want to build in any one year?

Mr. PAGE. Very little. I had one conference with the chief engineer of the Maryland Highway Commission, and he said that arrange-

ments could be made. Of course where they have already constructed a good road we would only use the surfacing mixtures, and so forth, to apply to that. We would have his cost of the ordinary macadam, and then we would tack our cost on and add these surface treatments to keep the dust down, and we would keep accurate cost data of them.

The CHAIRMAN. Would you not be able to make arrangements with him or with the authorities in Maryland whereby you would be able to have this road built and surfaced just as you want it?

Mr. PAGE. Yes; they are constructing portions of it now, and some of it is worn out and will have to be resurfaced, and it is in that way that we would bring in the different types.

The CHAIRMAN. They have to build the road anyway. Why can you not persuade them to build it according to your plans and specifications, and therefore avoid the necessity of the purchase of expensive machinery, and the expense of building the road yourself?

Mr. PAGE. They say exactly what I would say if I were asked to do that, they have no authority. You see, that is one great opportunity that we have with the Government, to make experiments for everybody, so that each State and locality will not have to repeat experiments that are already made, and find out for themselves.

The Maryland legislature would say, and rightly: "We are not going to spend \$10,000 to make experiments for the benefit of all the other States."

The CHAIRMAN. But the Maryland legislature, I take it, does not enact the plans and specifications for every road that is built in that State?

Mr. PAGE. Oh, no; only the State roads.

The CHAIRMAN. And I wondered whether the State highway engineer, or whoever has charge of the roads of the State, might not be willing, on new constructions, to follow your plans?

Mr. PAGE. He would aid greatly, and I hope to get a great deal of assistance from Maryland in that way, in every way that their law provides. They would be perfectly willing to cooperate, and I think a good many of these materials I can get for nothing; but the most important thing which we have to meet in the road situation to-day is the question of maintenance. Now, I am not far wrong when I say that there is practically no State in the Union that has a law which provides for the improvement of roads and for the maintaining of them after they are improved, and a great deal of my time has been taken up in the last few years in preparing State aid bills, to be considered by State legislatures.

Mr. COCKS. The New York State law certainly provides for the maintenance of its roads.

Mr. PAGE. New York is the only State, with the exception of Louisiana. They are the only two States in the Union that provide for it, and that is only for State roads.

Mr. COCKS. But then we have besides that an addition of 50 per cent of every dollar raised in the community, and that applies to all our roads, and that must be applied under the direction of the chief engineer of the highway commission by the county engineer. I think, so far as law is concerned, we are pretty well fixed.

Mr. PAGE. Yes, and you have appropriated \$55,000,000 to carry it through.

Mr. COCKS. That is in addition to all the counties. My own county has spent a million dollars on its roads.

Mr. LAMB. You can not expect us in the South to do what they do in those States in the North, because they have a wealthy population and a constantly increasing population and all that.

Mr. PAGE. Yes.

Mr. McLAUGHLIN. Have you discovered any material that you can use for resurfacing the brick pavements that are broken up and worn out and need repairs?

Mr. PAGE. I have not. Brick pavement we will probably have to consider later on; but that is principally a city pavement, and so far we have all we can do to look after the rural highways, and that is primarily what the road office is for. You see, cities have their engineer forces, and if a city wants to get honest pavement they will have no trouble in getting it; but the country is in an awful fix. One of the worst calamities in the country to-day is the borrowing of large sums of money by the counties and expending them on roads without skilled supervision.

Mr. LAMB. Yes; they are going to bankrupt themselves.

Mr. PAGE. They are doing it. If we had the bonded indebtedness of all our counties I believe we would find that they are spending more on their roads than——

Mr. BEALL. They are spending a million dollars in my county, right now.

Mr. PAGE. And they do not maintain the roads after they are built, and they go to pieces. The best road will go to pieces in a very few years unless it is continuously maintained; and that is what I want to have on this road here, so that I can show them how a road is maintained all the time, and I want to use it as a sort of school where county and other officials who want to learn can see just how it is done. You can preach it to them, but you can not tell a man how to maintain a road all the time by a patrol system, the way it is done in Europe. They do not understand it.

The CHAIRMAN. We are anxious to conclude the consideration of the bill this evening, and so I will ask you to state, as briefly as may be, just the occasion for introducing the words "and elsewhere," in your third paragraph? What occasion have you for investigating, or what do you propose to do in the investigation of road making outside of the United States?

Mr. PAGE. The trouble came in last year. Some consul abroad wrote and asked if we could buy some photographs from him, and through a mistake it was put up for legal decision, because according to my view I had the right to buy any material outside of the United States, or to spend any part of my appropriation. I thought it was broad enough if it said "elsewhere" in a number of other paragraphs, but it was not in this paragraph, and Mr. Zappone can tell you that to-day I can not buy anything outside of the United States.

Mr. ZAPPONE. That is on account of the special wording of the law, which says "throughout the United States." That is the reason the solicitor of the department thought we should limit operations under it to the United States. The result could be accomplished if you would make the paragraph read "For investigations of the best methods of road making and the best kinds of road-making materials."

Mr. PAGE. That would be all right if you would strike out all that follows.

Mr. ZAPPONE. That would accomplish the same purpose.

Mr. McLAUGHLIN. Did the legal officers advise you that you could not buy photographs that were taken outside of the United States to help you to learn how to make roads within the United States?

Mr. PAGE. Yes.

The CHAIRMAN. Would they construe that so strictly as to make it impossible for you to buy instruments—for example, laboratory instruments or office instruments—that were made abroad?

Mr. PAGE. I did not ask them for a decision on that. I hardly think it would be construed that way.

Mr. ZAPPONE. Laboratory instruments are completed articles; but you were procuring services abroad, were you not? You were not buying the photographs?

Mr. PAGE. This man wanted to sell us some photographs. He wanted us to procure these photographs. I think he was consul at Toulon.

Mr. ZAPPONE. He wanted to secure the services of a photographer to make those photographs?

Mr. PAGE. He wanted to do it himself.

Mr. ZAPPONE. He wanted to do it himself?

Mr. PAGE. Yes.

Mr. ZAPPONE. To actually do the work?

Mr. PAGE. Yes.

Mr. ZAPPONE. That is the distinction. There is no objection to buying materials abroad; we are doing that every day; but you were paying for services.

The CHAIRMAN. I do not see how such a construction can be put upon it. It would be absurd, obviously, to forbid you to buy materials, such as office material or office fixtures, which were an absolute necessity for the work of your office merely because they happened to be manufactured abroad.

Mr. ZAPPONE. The point was that this was for services and not for material.

The CHAIRMAN. We will consider that later.

Mr. STANLEY. I think the suggestion is wise to cut out those words "throughout the United States."

Mr. PAGE. Would not that be objected to on the floor?

The CHAIRMAN. We will consider that. Are there any further questions that any members of the committee desire to ask Mr. Page? Have you anything else that you would like to submit to the committee, Mr. Page?

Mr. PAGE. Mr. Chairman, Mr. Corthell, a very eminent civil engineer, told me that he had had a conversation with you in regard to getting an additional appropriation made to my bureau—I think it was for the sum of \$5,000—so that the United States could participate in the international road congresses.

The CHAIRMAN. I remember such a conversation.

Mr. PAGE. And he wrote and asked me, if you did not call my attention to it, would I please remind you of it.

The CHAIRMAN. I am glad you brought it up. I suggested to him that he ask you to do so, lest I might overlook it. We would be glad to hear anything you have to say in relation to it.

Mr. PAGE. There have been two of these international congresses, one held at Paris and one held at Brussels last year, and I think

30-odd governments are represented, and they became members of this congress. The French Government and other important governments have put up \$3,000 a year each, and they collect all material relating to road work and everything pertaining to roads and publish it, and have these meetings at which the most eminent road experts in the world meet and prepare papers ahead of time. These papers are discussed at the meetings, and they are publications of the very greatest value. The congress is doing admirable work, and I think that this Government would profit greatly; that is, the people, not the Government, but the people of the country, would profit greatly by the Government participating in it.

The CHAIRMAN. There has been no estimate for this.

Mr. PAGE. Even Cuba, China, and Japan have been participating.

Mr. HOWELL. Is the information obtained at these congresses confined to those who participate in them?

Mr. PAGE. Only members.

Mr. HOWELL. The information is confined to the members?

Mr. PAGE. Yes.

The CHAIRMAN. To just what purpose would this \$5,000 be devoted if it should be appropriated?

Mr. PAGE. Three thousand dollars would be the cost of the Government's membership—that is, if it came in as most of the first-class nations have come in—and then they have a council appointed and each nation has a member on this council, which arranges for the publication, and decides on the general policy to be pursued, and that would mean somebody going abroad to attend the meetings, or there would be others coming here when they met here.

The CHAIRMAN. And is it intended to pay expenses?

Mr. PAGE. To defray the expenses of delegates.

Mr. HAWLEY. Three thousand dollars would be the initiation fee?

Mr. PAGE. The yearly dues.

Mr. HAWLEY. The yearly dues?

Mr. PAGE. Yes; it is founded on the same general lines as the navigation congress.

The CHAIRMAN. You did not mention the names of the nations which participate in it now, did you?

Mr. PAGE. No; only two or three.

The CHAIRMAN. Will you insert, when you revise your statement, the entire list, if you have it?

Mr. PAGE. I have not the complete list, but have been informed by correspondence that practically all Governments except England, Italy, and the United States had become members and that England was preparing to do so.

The CHAIRMAN. The matter will be given consideration by the committee. If there is nothing further, and if you have nothing further, we will not detain you longer. We are greatly obliged to you.

Mr. PAGE. Thank you, sir.

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, D. C., December 16, 1910.

AFTERNOON SESSION (continued).

The CHAIRMAN. We have present this afternoon Dr. Thompson, president of the State University of Ohio, and Dr. Jordan, director of the experiment station at Geneva, N. Y., who are here, I presume, as representatives of the Association of American Agricultural Colleges and Experiment Stations, and no doubt have some matters which they would like to present to the committee.

They are rather familiar visitors here; we have had them with us nearly every year, and we are always glad to have them, and if they should like to present any matters at this time, the committee will take pleasure in hearing them.

Mr. THOMPSON. Mr. Chairman, Dr. Jordan has been a member of the executive committee of the association for a number of years, but is now president of the Association of American Agricultural Colleges and Experiment Stations, and is also a member of the executive committee, and I should suggest that you hear him first. There are four matters to be presented to this committee for consideration. Dr. Jordan will present two of them and I will present two, so as not to be repeating each other. Dr. Jordan will present the matter of the semicentennial and of the Research Journal, and I would prefer that you hear the president of the association first, if you will, Mr. Chairman.

The CHAIRMAN. We will be glad to hear from Dr. Jordan.

**STATEMENT OF W. H. JORDAN, PRESIDENT OF THE ASSOCIATION
OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT
STATIONS.**

Mr. JORDAN. Mr. Chairman and gentlemen, I hope familiarity does not breed contempt.

The CHAIRMAN. No danger of that, whatever, in the present instance.

Mr. JORDAN. You will recall, Mr. Chairman, that last spring Dr. True and myself, through your courtesy, had a brief conference with you concerning the matter of our semicentennial. It may not have occurred to all of the committee that in the year 1912 the Department of Agriculture will be 50 years old. It will also be the fiftieth anniversary of the first Morrill Act, the land grant act, and it will also be the twenty-fifth anniversary of the passage of the Hatch Act. It seemed to the Association of American Agricultural Colleges and Experiment Stations, that such a culmination of events should not remain unnoticed. The Association called the attention of its executive committee to the matter, and the executive committee

asked me to act as its representative in connection with Dr. True, who was named as the representative of the Department of Agriculture, to go into this question and make some recommendations. The result was that we recommended to the association the holding of the Third International Congress of Agricultural Education in this country in 1912. We based that recommendation upon some investigations of our own, during which we learned that the international officers were very glad to assent to our proposition to hold the congress in this country in 1912.

The CHAIRMAN. Where have the two previous meetings been held?

Mr. JORDAN. One at Paris and the other at Liege, Belgium. At the last meeting of the association we were instructed to proceed with this matter, and two resolutions have been prepared, which I beg the privilege of presenting to the committee, and which I hope you may take under your fatherly care and see that they go into effect. I will read the first one:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and is hereby, authorized to invite the International Commission of Agricultural Education to hold the Third International Congress of Agricultural Education, in cooperation with the Department of Agriculture and the Association of American Agricultural Colleges and Experiment Stations, in the city of Washington, District of Columbia, in the year nineteen hundred and twelve, in commemoration of the passage of the acts of Congress of eighteen hundred and sixty-two and eighteen hundred and eighty-seven establishing the Department of Agriculture and endowing the agricultural colleges and experiment stations.

This resolution is desired because we hope that this may be made an official matter and that the President of the United States may be authorized to invite other nations to cooperate in this matter. It seems to the association that these events are worthy of international attention, and it will give an opportunity for us to obtain an acquaintance with the movements in agricultural education in other lands as it could hardly be obtained in any other way, and will give other nations the opportunity to know what we are doing. I will present the other resolution now, which will give a little idea of what we hope to accomplish. We hope to have this made an item in the appropriations that you recommend:

To enable the Government of the United States suitably to participate in the Third International Congress of Agricultural Education, to be held at the city of Washington, District of Columbia, in nineteen hundred and twelve, in pursuance of the invitation to be extended by the President of the United States in virtue of the joint resolution of the Congress thereof, approved ———, and to meet the expenses that will actually and necessarily be incurred by the United States by reason of such invitation and meeting, and to prepare, print, illustrate, and distribute the proceedings of said Congress, including a history of agricultural education and research in the United States, twenty-five thousand dollars, or so much thereof as may be required, and this fund shall be available until used: *And provided further, That five thousand dollars of this sum shall be immediately available.*

The purposes for which this money would be used I think are well stated in this resolution. It would be necessary, as you will easily recognize, Mr. Chairman, to employ some special agent to take in hand at once the organization of this congress, some one who can give to it his whole time, some one of sufficient ability so that he should receive a fairly good salary. That would be the first expenditure, together with the necessary printing and that sort of thing. Now, I shall be glad to answer any questions concerning this. I have presented the facts in the main.

The CHAIRMAN. Has either of those resolutions been introduced into Congress?

Mr. JORDAN. No, sir.

The CHAIRMAN. Does either of them designate any officer of the Government or any other specified individual to whom this money, which it is proposed to appropriate, shall be paid?

Mr. JORDAN. Neither resolution does. The resolution with reference to the appropriation does not. It will be necessary, I suppose, to make some individual or department responsible.

The CHAIRMAN. I should think that would be a necessary part of the resolution.

Mr. JORDAN. Yes.

The CHAIRMAN. Have you considered the advisability of consolidating the two and letting the joint resolution carry also in a second section an appropriation for the expense?

Mr. JORDAN. We had not considered that, sir; but if it is proper and desirable there certainly would be no objection.

Mr. McLAUGHLIN. To provide for the appointment of somebody, or make the head of some of the departments take it in hand?

Mr. JORDAN. Yes.

The CHAIRMAN. It would seem to me that the whole matter might well be combined in one resolution.

Mr. JORDAN. Yes.

The CHAIRMAN. Because it would be just as easy to pass all of it as to pass any part of it; and that the resolution should contain the three propositions, the authority to the President in the first place to invite the participation of other nations, and the appropriation for carrying that resolution into effect, and the designation of the proper department through which the money should be expended.

Mr. JORDAN. So far as the administration of this is concerned, or at least the initiative this would probably be a joint effort between the Department of Agriculture and the Association of American Agricultural Colleges and Experiment Stations, and upon the department and the association would fall the responsibility of the initiating, in the way of organization.

The CHAIRMAN. Yes; that would be naturally a matter for the department and the association to consider.

Mr. THOMPSON. Mr. Chairman, if I may interrupt, I want to say just a word. Dr. True and Dr. Jordan constitute a special committee for conference between the Department of Agriculture and the association, and Dr. True is here, and I would like you to hear from him.

Mr. TRUE. I want to say that the resolutions were drawn in the form in which they are drawn because upon looking up precedents in this case we found that the business had been done in that way for other international congresses.

The CHAIRMAN. What did you find in relation to the expenditure of the appropriation?

Mr. TRUE. Well, I suppose that the appropriation went to the bureau or the department where the matter properly belonged. When the International Fisheries Association met here, there was similar action, and as I understand it, in that case the money was expended under the direction of the Bureau of Fisheries.

The CHAIRMAN. Did the bill or the paragraph carrying the appropriation designate any official or department which should have the disbursement of that fund?

Mr. TRUE. I understand not.

Mr. HAUGEN. This is intended as an amendment to the appropriation bill of the Agricultural Department, and it designates the Secretary of Agriculture.

Mr. TRUE. Yes.

Mr. HAUGEN. If it is an ordinary resolution it will be necessary to designate, but if it is offered as an amendment it is not necessary to designate anybody by name.

Mr. TRUE. If it is put in this bill it would come under the Secretary of Agriculture, I should think.

The CHAIRMAN. Whatever is done, it will be very easy to do it, I should think. Dr. Jordan, will you resume?

Dr. JORDAN. The other matter to which I wish to call your attention, Mr. Chairman, I think has already been presented to the committee by Dr. True, and that is our Research Journal.

The CHAIRMAN. Yes, Dr. True discussed that to some extent.

Dr. JORDAN. You will recall that I presented the matter to you a year ago. We are very anxious that that item in the recommendation of the Secretary, for \$20,000 for this purpose, shall be approved by this committee. The organization of the literature of agriculture on its scientific side is a matter to which we should now give attention. As I stated to you on a former occasion, the results of a strictly scientific character are very much scattered. Much of the station literature and much of the literature of the Department of Agriculture is of the semipopular type, and the scientific work is mixed with that in a way that practically obscures it.

We want some means of putting the scientific results in a concise form, so that they will be available to the scientific men of this country and of other countries. I think it is due to the immense amount of work which our scientific workers in the colleges and stations are doing that some avenue of that kind should be afforded them. The statement might be made that they have open to them the scientific journals, but when the work of the botanist and the chemist and the entomologist and other divisions of scientific work are scattered through all the great number of scientific journals, there is no coherence, and it is so much scattered as to lose its effect, as the work the stations are doing. I made a statement, I think, when I was here before that we want this done particularly, in order that the scientific literature of the experiment stations which goes to the universities and larger colleges that are not agricultural may be presented in a way that may be commensurate with what we are doing, and it is only in some such way as this that it can be done. The Government has already set an example in publishing the work of the Smithsonian Institution—work of a scientific character—as fast as that work is ready for publication, and I hope that this committee will feel that this is of sufficient importance to warrant them in including it in the appropriation bill. That is all I have to say.

STATEMENT OF W. O. THOMPSON, CHAIRMAN OF THE EXECUTIVE COMMITTEE OF THE ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

Mr. THOMPSON. Mr. Chairman, there are two items I desire to present. The first matter is the matter of the Adams Act, which I think is understood by all the members of the committee. The

comptroller has made an interpretation of that act by which appropriations expire after five years, and there seems to be a misapprehension or a confusion about the date. At any rate, a bill has been introduced into the Senate appropriating \$30,000 to each State for the year 1912, and thereafter. We do not want \$30,000 in addition to the fund of the Hatch Act. The association desires that the Hatch Act and the Adams Act shall be continued. That makes a total of \$30,000. Now, the comptroller seems to have gotten an impression that appropriations under the Adams Act closed in 1912, but Congress has pushed that appropriation back, and as a matter of fact it will expire in 1911, so that we ought to have that appropriation go right on from this date. There were those two questions that were before us. One was whether we should ask this as an annual appropriation to be carried in the Secretary's budget from year to year as an additional item or whether the statute should be so amended as that this would be a permanent paragraph from this time, as it has been permanent from the passage of the act up to this date, and one of the two things ought to happen. I am quite sure that everyone wants the act continued in force.

The only question remaining is as to the form in which it shall continue. Not being attorneys or lawyers or lawmakers, the association assumed that the act would have to be reenacted, but I infer from just a short conference with the chairman that it is his opinion that the act stands, and that the appropriation will have to be made from year to year in order that the funds might be available for the stations in the several States. I desire, therefore, simply to bring this to the attention of the committee so that we shall be clear as to what the situation is, and I am sure that there will be no disposition anywhere to fail to renew that appropriation. The method by which it should be done of course is a matter of your judgment.

The CHAIRMAN. I think there is no doubt in the mind of anyone who was a Member of Congress at the time of the passage of the Adams Act that the intent was that the act should be permanent, and that it was also the expectation I know in the mind of Mr. Adams, who drew the bill, and I think also in the minds of all who voted for it or upon it, that when the act matured and the sum of \$15,000 had been reached at the end of five years, then that amount was to be regarded as a permanent appropriation continuing indefinitely. Since the comptroller has ruled otherwise, it makes it necessary, of course, that the money should be appropriated either by an act of Congress extending the permanent appropriation or by annual appropriations.

I think I may say that there is a growing tendency in the minds of Members of the Congress to favor annual appropriations rather than permanent appropriations. They take the view that all the appropriations of money intended to carry forward the various activities of the Government should come under the scrutiny of Congress every year; and furthermore, as you know, there is carried in this bill every year the appropriation necessary to carry into effect the provisions of the Hatch Act. It would be therefore in accordance with the precedents to let the amount necessary to carry out the provision of the Adams Act appear in the bill annually, and I do not think there will be any difficulty about it.

Mr. THOMPSON. Mr. Chairman and gentlemen, I want our position simply to be made clear, that the association felt under that ruling

that they ought to charge the executive committee with the duty of presenting the situation to this committee in order that it should not be in any way overlooked. We are not in any mood of suggesting how the thing shall be done, but in a mood to earnestly insist, if that is the word to use, that what is generally conceded now shall not be overlooked, and if Congress prefers to make the annual appropriation, that is for Congress to say, not for us to suggest. If they would pass a statute making permanent what was originally intended, of course that would be entirely agreeable to the several stations.

The CHAIRMAN. You do entirely right, of course, to bring it to the attention of the committee, and I am sure that the committee is very much gratified to hear the statement that you actually do not want at this time more money than the present law provides for.

Mr. THOMPSON. Now, Mr. Chairman, with your courtesy and consent—and I promise not to detain you—I want to present to you a matter that I did present to you in a letter a short time ago. I wrote to the chairman a few days ago of the several duties with which the executive committee of the Association of American Agricultural Colleges and Experiment Stations had been charged, and I neglected one of them, but I think I did not neglect Mr. McLaughlin's bill, House bill No. 15422. I want to state what the attitude of the association is on that matter. As you recall, the association presented that a year ago, and the committee did not, in its wisdom, see fit to report it out for passage, so that the matter is lying here awaiting your further consideration, and we are here to renew our request that that bill be put upon its passage.

The association so took action at its meeting recently held in Washington, and asked us to present the matter, and we do it with all the earnestness and straightforwardness with which we presented the matter a year ago. I do not think it is necessary for us now to take your time or to use your energy in listening to an argument for that bill, but I should like to call your attention to the fact that we were asking it last year, and we are of the same opinion still, with the added zeal of the year, and the moderated judgment of experience, that that bill ought to pass, and we should like to have it passed, and we would like to have you report it for passage, and we believe that if you do that you will commend yourselves to the favorable consideration of the agricultural interests of this country and the interests of education; and it does not involve a large or extravagant amount of money, in our judgment.

The CHAIRMAN. Is there anything further, Dr. Thompson?

Mr. THOMPSON. That is all I have to say upon that matter, Mr. Chairman, unless it is desired to ask some questions.

The CHAIRMAN. Are there any questions that any member of the committee desires to ask of Dr. Jordan or Dr. Thompson? I think not, and we will not detain you further. We are very glad to have had you present with us.

Mr. THOMPSON. I thank you, gentlemen.

(At 4.30 o'clock p. m. the committee adjourned.)

**COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Washington, December 17, 1910.**

The committee this day met, Hon. Charles F. Scott (chairman) presiding.

The CHAIRMAN. The members of the committee will remember that when Dr. Melvin was here a few days ago he brought to the attention of the committee the fact that the suggestion had come from the War Department to the Department of Agriculture that a cooperation should be entered into between the two departments looking to the encouragement of the breeding of horses suitable for the various branches of the Army service. It occurred to me that the committee would like to hear a discussion of this subject from the Army point of view and Brig. Gen. Aleshire, the Quartermaster General of the Army, has been kind enough to consent to appear this morning. We would be glad if Gen. Aleshire would present the matter from the point of view of the Army.

STATEMENT OF BRIG. GEN. JAMES B. ALESHIRE, QUARTERMASTER GENERAL UNITED STATES ARMY.

Gen. ALESHIRE. Mr. Chairman, my experience with the supply of animals for the United States Army, cavalry and artillery horses and draft mules, extends from 1895, when I was first appointed from the Cavalry to the quartermaster's department. I was assigned to the station at St. Louis and assigned to duty purchasing cavalry and artillery horses and draft animals. At that time there was an abundance of suitable horses especially in Missouri, Kentucky, Ohio, Indiana, Illinois, and Kansas, in all of which States, I purchased horses from 1895 up to the outbreak of the Spanish War.

In September, 1898, I was relieved from that duty and had no more connection with it until I returned from the Philippines in 1903, when I was assigned to the same duty and purchased horses over the same section of the country. I was surprised to see what a great change had taken place as to the practicability of securing the horses that were suitable for our mounted service. I was continued on this duty until the fall of 1904, and during that one year it was with considerable difficulty and only after unusual efforts that we could find horses suitable for our service. My experience was that of other officers who relieved me and who have since been assigned to that duty.

In the hearing before the Committee on Military Affairs of the House when the appropriations for the fiscal year 1909 were under consideration, I represented the condition of affairs to the Military Committee and urged upon them that we be given authority by law to establish remount service so that we could purchase young horses, three years old approximately, and take them to our remount sta-

tions and hold them until they were four years old. In that way we would create a market of our own. The horse dealers generally do not buy young horses. That has helped us considerably, but we find that the officers purchasing the young horses are unable to buy them as rapidly as we would like owing, to the scarcity of suitable young horses.

When I was before the Committee on Military Affairs in January, 1908, the question as to the supply of these young horses was considered and I made this statement to the committee, if I may read it?

The CHAIRMAN. Certainly.

Gen. ALESHIRE (reading):

My idea is, after we learned something of the mares in the several sections, the Government should send to those sections in which are found well-bred mares of quality, conformation, and action such as desired in cavalry horses, stallions, suitable for breeding superior cavalry horses, the farmers to be given the free service of these stallions for all mares that possess the qualities so essential to high-class cavalry horses and the Government to reserve the option of purchasing the colts when from 3 to 4 years old. Mares that are not suitable should not be bred to these stallions.

It was not my intention that that should be taken up by the War Department. However, judging from a proviso that appeared in the appropriation bill under consideration during that hearing, the Committee on Military Affairs of the House evidently thought that that was the idea, because that bill provided "That no part of this appropriation shall be used for breeding purposes." After, perhaps, a year and a half's effort to secure these young horses, as I have stated, the scarcity was very marked and I wrote a letter, as Quartermaster General, to the Secretary of War, suggesting that the question be taken up with the Department of Agriculture, with a view to having that department undertake the encouragement, at least, of breeding horses suitable for our service. The Secretary of War approved of that plan and addressed a communication to the Secretary of Agriculture, and the views therein expressed were concurred in, and then followed a correspondence which has resulted most fortunately for the War Department. The Department of Agriculture is to undertake the breeding of these horses.

I doubt if anyone not familiar with all the details and the trouble we have in finding suitable horses can appreciate what a splendid benefit it will be to the service to have suitable horses bred.

The CHAIRMAN. Do you have any difficulty in securing draft animals?

Gen. ALESHIRE. Not draft animals. We buy mules generally for draft purposes. We only buy a light horse for a draft horse, except at a few places. At West Point, for instance, we have 8 or 10 of these large draft horses, but the large draft horse is not used by the Quartermaster's Department. All our draft animals are mules.

The CHAIRMAN. Your trouble comes in finding suitable horses for artillery and cavalry?

Gen. ALESHIRE. Yes, sir.

The CHAIRMAN. Do you remember what price you have to pay now?

Gen. ALESHIRE. The average price during the last fiscal year was approximately \$175 for the cavalry and something over \$200 for the artillery horses. That is the matured horse. That is the horse that we can put right into the service. The young horse has cost much less—the average price.

The CHAIRMAN. Has there been any appreciable tendency downward in price since the beginning of this fiscal year?

Gen. ALESHIRE. No, sir. We are making all our efforts to purchase young horses. I do not know but it may be of interest to the committee to know the plan that we formulated and which we think is going to be a great step toward economy in furnishing remounts. I searched the records—I have forgotten how far back I went, but a period of 25 years was covered, exclusive of unusual occurrences, such as the Spanish War, Philippine insurrection, or any campaign that would use up horses.

Considering the number of cavalry and artillery horses supplied during that period of 25 years, it was found that the period of duration of cavalry and artillery horses was only 6.4 years. With these young horses properly bred and properly selected and carefully handled at the remount stations and sent to our troops at posts where they can and will be given 6 or 8 months further handling before they take up actual work, we predict that the period of duration of horses will be 10 years at least, so that instead of supplying an entire mount for an organization or for the Army once every 6 years, it will be once in 10 years. I prepared a statement for the Committee on Military Affairs this year; it appears in this year's hearings, showing how that runs into money. My recollection is that paying all of the expenses of the young horse at the remount station, and considering the maximum number of horses we would have to supply there, was a difference of nearly \$150,000 a year in favor of the young horse properly bred under the supervision of the Department of Agriculture, and the remount-station plan.

The CHAIRMAN. How many horses does it take to keep the Army supplied?

Gen. ALESHIRE. In the United States, for the Artillery and Cavalry, approximately 17,500. There are in the Philippine Islands, 7,500 or 8,000. It is difficult to hold the number of animals in the Philippines exactly within the prescribed limit as authorized, because there is bound to be a few more or less, owing to the long distance which we have to ship them.

The CHAIRMAN. Do you know how many you buy on an average each year?

Gen. ALESHIRE. On the 10 per cent basis we would buy approximately 1,750. I have the data showing just what we bought last year, but it is at the office. I could tell you.

The CHAIRMAN. It would be in that neighborhood?

Gen. ALESHIRE. I think, including all the horses purchased in 1910, the last fiscal year, we bought probably more than that, because we bought quite a few matured horses.

The CHAIRMAN. And you find it difficult to buy even 2,000 horses in the course of a year to meet your requirements?

Gen. ALESHIRE. Yes, sir.

The CHAIRMAN. Is that due to the general scarcity of horses throughout the country, to the fact that the farmers are not breeding in the quantity they formerly did, or is it owing to the fact that they are breeding a type of horse not suitable for the service?

Gen. ALESHIRE. Breeding a type of horse not suitable for our service. A great many horses, according to the reports we receive from our purchasing officers, are not suitable for anything. It has

been stated that it is not unusual for a farmer who may have a good mare to be apparently indifferent as to how he breeds her, and it is only in a comparatively few places that you find horses bred as we want them.

The CHAIRMAN. Have you ever tried buying horses for the Philippine service in Australia?

Gen. ALESHIRE. Yes, sir; that was done, I think, in 1907, and the reports have been favorable; but we can buy young horses in this country, if properly bred, and supply them through our remount stations, transporting them by the transport *Dix*, which carries 500, and do much better than buying the horses there. At this time the policy has been to supply matured horses to the Philippines. But we can not buy enough suitable matured horses within a reasonable time to supply the demands of the Philippines, and therefore have to take the best we can get. It is unfortunate and very expensive to have to ship horses that are not absolutely satisfactory.

Mr. McDERMOTT. Suppose they have a thoroughbred strain?

Gen. ALESHIRE. We think that would be very good.

Mr. STANLEY. Is not the difficulty in getting suitable mounts due to the scarcity of the saddle horse and the racing horse?

Gen. ALESHIRE. It is undoubtedly due to that fact. The saddle horse—that is, the clean-bred saddle horse, to which reference is made—is not entirely suitable for the service. We can not get all of our horses to take the gaits peculiar to the saddle horse, but the saddle mare, crossed with a thoroughbred, if you please, or a standard-bred, will give us a horse that has the conformation, or a standard-bred mare or thoroughbred, crossed with a saddle-bred stallion, gives us the conformation, and they usually also have the action we desire.

Mr. STANLEY. In investigating those sections where you would be most likely to get the type of horse you need in the Army, has your attention been called to places where they formerly bred horses? I was going to suggest that in a great many parts of the country, in Kentucky and in Missouri, they have stables and paddocks and rolling ground for the colts to develop their muscles, when young, and so, while they are going to rack and ruin, it is true, in a few years, it strikes me that those men who formerly bred race horses might by changing the character of cross just a little and using the plant that they formerly used in producing racing horses, could produce the finest type of Army horse in the world. The size, durability, bone, and courage that are essential in a race horse, I should think would be equally suitable in the Army.

Gen. ALESHIRE. There is no question about that, sir, but I do not believe that horse dealers and traders and those experienced breeders to whom you refer would take up that line of breeding unless encouraged by the Department of Agriculture.

Mr. STANLEY. I believe that is necessary.

Mr. COCKS. They would not want to breed horses at \$150 or \$200 apiece?

Gen. ALESHIRE. We propose to buy them when they are young. It will not be necessary to put much money in the horses, as we shorten the time the farmer would usually keep the animal by one and a half to two years.

Mr. COCKS. Under the old régime they used to get \$10,000 or \$15,000 once in a while.

Mr. LAMB. Fifty years ago this country supplied the cavalry and artillery of two tremendous armies with sufficient horses, and it is remarkable now, with twice the population and resources, that you can not buy 1,700 horses. I have seen 20,000 mounted men and fought with them all day long.

Gen. ALESHIRE. But you go into the State of Virginia—and we have had an officer there for two years—and he travels wherever he hears of a horse. Mind you, there are horses in Virginia that we would be glad to have, but the price is beyond us.

Mr. LAMB. There must be some way to account for it.

Gen. ALESHIRE. The time you referred to, during the Civil War—in fact, until the last 10 or 15 years, or perhaps I am in error as to the more recent period, but certainly during the time of the civil war—the big draft horse was a very scarce animal in this country, while at the present time large draft horses are extensively bred all over the United States.

Mr. LAMB. He would not do for the cavalry service. Our fellows traded some of their horses in Pennsylvania and they did not last more than three or four days. I told them not to trade for those great big Pennsylvania horses; "If you do, you will walk back to Virginia." [Laughter.]

Gen. ALESHIRE. That is what we want to do—avoid walking back from any place.

Mr. HAWLEY. Have you taken up this question with any of the great horse raisers in the West, the ranchers, to see if some one or two of them would not breed horses exclusively for the Army, being assured of a definite market?

Gen. ALESHIRE. We have taken up that question quite thoroughly, especially in Montana and the Northwest. We buy a great many young horses in Montana at Fort Keough, one of the remount stations, and I have sent two lots, about 300, down to Fort Reno, with a view to having them handled in connection with the horses mostly from Kentucky and Virginia. They look first-rate in Montana; but when you get them with the other horses they are apparently not so well bred and their dispositions are not as good, although we have found in the Northwest, and especially in Montana, many splendid horses. There are about a dozen ranches in Montana belonging almost exclusively to Englishmen who went there to breed horses, hunters, with a view to shipping them to England. They did follow that for a while. Some of those gentlemen are breeding draft horses. Some of them still have a few mares and stallions left of the hunter type. We have gotten some very good horses in Montana, in the western part of the State, from a gentleman by the name of Larrabee. We found some splendid mares. He said they were Morgan mares and he has crossed them with thoroughbred stallions and standard-bred stallions. We have 44 animals bought from that ranch, very high-class horses, but Mr. Larrabee is going out of business. That is the disposition of all of them—to go out of business for some reason or another. I think, generally, due to the fact that they have not the extent of ranges they formerly had, have to fence their own holdings to insure the necessary pasture, and are not then certain of good grass unless they have water to irrigate their fields.

Mr. McDERMOTT. What is the age and price of the average Montana horse?

Gen. ALESHIRE. The average price is about \$110, 3 years old.

Mr. LEVER. Is it your plan to have the Government own the stallions?

Gen. ALESHIRE. I think the Department of Agriculture has that idea.

Mr. HAWLEY. And own the mares also?

Gen. ALESHIRE. No, sir.

Mr. LEVER. These stallions would be in a given community in charge of an expert of the Department of Agriculture?

Gen. ALESHIRE. That has all been worked out. I should hesitate to reply to a question as to the details of plans worked out by the Department of Agriculture, but, generally speaking, that is the idea.

Mr. STANLEY. Have you ever tried a cross between a trotting horse and some thoroughbred stallion, the first cross?

Gen. ALESHIRE. No, sir; we have never bred for the service. All my knowledge of breeding or the result of breeding is from what I have seen when buying horses. I recall such a cross as you speak of.

Mr. STANLEY. These thoroughbred mares that you speak of were disposed of a few years ago at a frightful loss, practically given away, and horses that were worth, prior to this legislation against racing, anywhere from \$1,000 to \$5,000 sold at from \$100 to \$300.

Gen. ALESHIRE. Yes, sir.

Mr. STANLEY. I should think they would make a great basis for the breeding of Army horses?

Gen. ALESHIRE. I should think they would.

Mr. McDERMOTT. Have they not in New York a breeding bureau under the jockey club?

Gen. ALESHIRE. I do not know, sir. In one of the regiments, the Seventh Regiment, or a squadron of cavalry, they have a stallion or two and are quite interested in breeding.

Mr. McDERMOTT. The jockey club gives certain stallions which are nicely bred and which are loaned to the farmers in communities in the State of New York. Has there been any result from it, Mr. Cocks?

Mr. COCKS. No; not any beneficial results.

Mr. HAUGEN. Is not the scarcity you speak of due to the demand for draft horses?

Gen. ALESHIRE. That might be. I have been told by a gentleman well informed as to the Chicago market and the St. Louis market that the demand for driving horses and coach horses exceeds the supply; that the dealers never got as much for coach horses as now.

Mr. HAUGEN. How do the prices paid for these horses compare with the price of a first-class draft horse?

Gen. ALESHIRE. I do not know the price of the draft horse.

Mr. HAUGEN. Can you get a good draft horse for \$250?

Gen. ALESHIRE. Yes, sir; I should think you might. We want to get good horses and get them for less money, and our experience would indicate that we can not purchase horses suitable for the mounted service at a reasonable price unless something is done to encourage the farmers to breed the horses desired. It is proposed to buy them when young and relieve the farmers of wintering them one or two winters. I think that would make a difference in the cost of the animals.

The CHAIRMAN. Dr. Melvin, would you like to be heard further in regard to this matter?

Dr. MELVIN. I would like Mr. Rommel to present the plan of the department. Mr. Rommel is the officer designated to confer with the Army in reference to this plan.

The CHAIRMAN. We shall be very glad to hear from him.

STATEMENT OF MR. GEORGE M. ROMMEL, CHIEF, ANIMAL HUSBANDRY DIVISION, BUREAU OF ANIMAL INDUSTRY, DEPARTMENT OF AGRICULTURE.

Mr. ROMMEL. The following discussion, presenting in detail the difficulty of obtaining suitable horses for army use, the great need of Government encouragement of breeding such horses, and a definite plan for accomplishing the desired object, is the result of the joint consideration of the subject by representatives of the Department of Agriculture and the War Department at the instance of the Secretary of War. The Department of Agriculture was represented by the Chief of the Animal Husbandry Division of the Bureau of Animal Industry, and the War Department by Capt. Casper H. Conrad, jr., Third Cavalry, United States Army, detailed for duty in the Quartermaster General's Department in connection with the purchase of remounts.

The statement setting forth the reasons why the War Department regards it as imperative for the Government to undertake the work of encouraging the breeding of horses for the Army was prepared by Capt. Conrad and is inserted here with the consent and approval of the Quartermaster General. The plan for breeding the horses was prepared by the Chief of the Animal Husbandry Division with the assistance of Capt. Conrad and other officers of the Army stationed in Washington, and has been formally approved by the War Department.

The difficulty experienced by the Quartermaster's Department in procuring remounts seems perfectly natural. The early settlement of the United States, particularly the eastern part, went on some time before the advent of steam and electric transportation, and the settlement of the western part even now in the most remote points takes place without the assistance of modern transportation. In all new countries the horse has played an important part in the advancement of civilization and the general scheme of settlement. Even in the first part of the nineteenth century the horse was a very much more important animal in Europe and the British Isles than at present.

During the opening of a country the settler must, owing to the absence of roads and other forms of transportation, put his principal reliance upon the horse; he is forced to travel trails and long distances, and for this purpose finds that he needs a horse suitable to carry him quickly and comfortably to his destination. To accompany him and carry the articles necessary for his daily life he needs a pack animal. So long as conditions remain unchanged, a desirable type of saddle and pack animal will exist in good numbers, but so soon as the country becomes more settled and habitations more permanent, the mountain trail gives place to the road, and later the country road to the worked and metaled highway, and the type of horse rapidly changes. The necessity for the saddle animal lessens; the light draft animal becomes more important; the people ride less and discard

the expensive pack transportation; the horse is attached to a light vehicle with which he is able to transport more than one person or a heavier load. As the roads become better and the country more extensively cultivated the lighter horse is used more for pleasure or solely as a means of drawing the carriage; another type of horse becomes more useful and economical, and the light-draft type appears to be succeeded by the heavy draft. Next comes the railroad, the trolley lines, and the automobile. The people ride and drive less and fewer horses of the riding types are bred. Riding is indulged in almost solely for pleasure. A new country is a country on horse-back, an up-to-date one a country in an easy chair.

In the United States the type of horse suitable for Army purposes is now proportionately less numerous, because it is not found necessary to the civilians of the country, and the Quartermaster's Department is finding it each year more difficult to supply the yearly demands of the mounted branch of a small Army.

The horses of our mounted branches are severely criticised by representatives of foreign armies, while from our own officers come reports of poor animals, poor performance, many quickly developed unsoundnesses, and short life.

As an illustration—in the West it is found that a marked change has taken place in recent years in the so-called "cow pony." Twenty years ago cattle ranches of the West were practically without fences and unlimited, and the cowman found it necessary to breed and use a type of quick, active pony. As the West became settled and as agriculture was taken up, the large free ranges changed to the large fenced pastures of a few years ago. These large pastures are now being broken up into even smaller ones. The yearly round-up, requiring riding over immense distances and active work, has about disappeared. To-day cattle are not chased and roped, but are driven into the small pastures and pens and quietly handled. The quick cow pony of the past has given place to a larger animal, frequently having a cross of draft blood. It may be said that the cow pony of the West has practically disappeared.

Virginia has long been famous for the horse known as the Virginia hunter. Even the breeding of this type of horse has been sadly affected by the high price of heavy draft horses and further influenced by the fact that only those hunter-bred horses that attain full size brought high prices. Under the haphazard methods of breeding in vogue in these sections not more than one in six colts could be depended upon to attain the size necessary to bring a high price, and the farmer found himself the possessor of four or five small horses for which there was no steady market. When he found that all draft colts, in spite of minor blemishes, brought good prices as 3-year-olds, he at once ceased to breed the hunter type, with its many misfits, and commenced on heavy draft horses. The disappointment in the hunter-bred horse would not have been so great had the breeding of this type been done scientifically and rationally. The hunter-bred horse as now raised in Virginia is sired almost entirely by stallions either sent to the country gratis or sold at small price to individuals by wealthy people in the North who desire hunters and are looking to the future supply. A farmer living in the neighborhood of a thoroughbred stallion, and feeling that he would like to breed a hunter, will take advantage of the nearest and cheapest stallion in his neighborhood,

regardless of what the result may be. All that he considers necessary is that the horse should be, first, a thoroughbred and, second, that he should be a pleasing individual; never taking into consideration the fact that the mare might not be suited to the horse nor the horse to the mare. Hence the misfits, the discouragement, and the decrease in numbers of the hunter type. It is said that not one-tenth as many hunters are bred in Virginia to-day as formerly.

Even more appalling than the present scarcity of horses suitable for military purposes in this country is the large number of unsound horses that are constantly being examined by purchasing officers. Horses of this class can be the result of but one thing, and that is an absolutely irrational system of breeding, or the lack of any system whatsoever. When it is remembered that a sound and serviceable horse of a particular type costs no more to raise than an unsound horse, the immense waste caused by our present lack of system is only made more apparent.

The enactment in a number of States of laws whose effect is to prohibit the standing of unsound stallions for public service will no doubt, in time, tend to correct this evil; but not until the horse-raising States generally prohibit absolutely the public stud service of unsound stallions will unsound horses be less common on the market. Such legislation in one State is an excellent thing for that particular State, but it is very likely to drive all the unsound stallions across the borders into adjoining States where laws against the unsound stallion do not exist.

The next census will probably show that there are in the neighborhood of 23,000,000 horses in the United States. It would seem that in this immense number there must be many thousands of horses suitable as remounts for the Army, and there probably are; but the fact that the type desired is comparatively scarce, and that the horses that would do are scattered over an immense area and are in demand for other purposes than the military, makes it not only expensive and impracticable to obtain them, but next to impossible to do so.

The purchase of young horses for the Army during the last fiscal year has been more or less successful, but all officers connected with the Quartermaster's Department have reported that while they were obtaining a fair number of horses, they could see no prospect of obtaining them in any number in future years, and all report the apparent necessity for the Government's assistance in the rational breeding of Army horses in the country.

As no system of supply so far as the Army is concerned, which deals with peace conditions alone, is complete, the War Department must constantly keep in mind the possibilities of war, and it is not surprising that, finding difficulty in purchasing a supply of remounts for the peace Army, there should be more or less uneasiness when war requirements are considered.

The waste of horseflesh in war times is enormous, and in a war of any magnitude in which this country might be engaged the number of horses required will not be confined to the thousands per year, but will extend into the hundreds of thousands.

In this connection attention is invited to a few of the records on this subject:

There were purchased for the armies of the Federal Government in the fiscal year ending June 30, 1864, 188,718 horses. There were captured from the enemy and

reported 20,388. Leaving out of consideration those captured and not reported, it should be observed that the Army required 500 horses each day for remounts. This, therefore, is the measure of destruction of horses during the same period.

During the eight months of the year 1864 the cavalry of the Army of the Potomac was supplied with two remounts, nearly 40,000 horses. The supply of fresh horses to the army of Gen. Sheridan during his campaign in the valley of the Shenandoah has been at the rate of 150 per day.

During the Russian campaign the French crossed the Nieman in June, 1812, with cavalry, artillery, and train horses to the extent of 127,121. About 60,000 of these pertained to the cavalry. On December 13 the remnant of the invading army recrossed the Nieman with 1,600 cavalry horses. In six months the horses had all disappeared.

Examples of the terrible waste of horseflesh during the war might be multiplied ad libitum.

The question of remounts for the Army became so serious during the Civil War that in 1863 the Cavalry Bureau was established. One of the principal duties of this bureau was the purchase and inspection of horses for the Army. Six remount depots were established. The most important of these was Giesboro Manor, situated on the north bank of the Potomac nearly equal distance between Washington and Alexandria. To show the magnitude of operations of the Cavalry Bureau, the following report of the Giesboro depot is given:

On hand Oct. 1, 1863, cavalry horses	4, 281	
Received to Dec. 31, 1863	36, 932	
Total		41, 213
Issued	22, 204	
Sold	1, 651	
Died	1, 637	
Total		25, 492
On hand Jan. 1, 1864		15, 721
Received by purchase, Jan. 1, 1864, to June 30, 1866		5, 326
Received from other depots for issue		59, 507
Received for recuperation		85, 980
Received by transfer from artillery		4, 120
Total		170, 654
Issued to armies in the field	96, 006	
Issued to officers after June 30, 1865	1, 574	
Issued for sale or sold at depot	48, 721	
Died	24, 321	
Total		170, 622
On hand June 30, 1866		32

This does not take into consideration the twelve or thirteen thousand artillery horses handled at this depot.

This report closes with the abandonment of the depot, but it is to be remembered that nearly all the volunteer cavalry was mustered out immediately after the surrender of Gen. Lee's army the preceding year, so that nearly all the horses were handled during the period of 18 months.

Until recently acts of Congress appropriating money for the purchase of horses for the Army required that they should be purchased by contract from the lowest responsible bidder after advertisement. The specifications of the horse to be delivered under contract are those of a perfect animal, which, of course, is seldom seen. The inspectors and purchasing officers are required to reconcile the specifications with existing conditions, keeping in mind fairness both to the contractor and to the Government. This system led to the building up of the class of middlemen who purchased animals from the breeders, presented them for the action of the Government inspectors, and sold them at the contract price. Until recently this price ranged from

\$100 to \$150. Considering the large expense to which the contractor would be put, it could not be expected that all of the Government's money would be invested in horseflesh. The result was, considering the profit by the contractor, his expenses, etc., that the price paid by the Government secured for the cavalry a horse worth from \$70 to \$100. Nothing is known of the breeding of these animals, further than that they were "probably such-and-such breeding." Often the question of breeding was not raised, the principal requisite being that they should give promise of performing the duties expected of them.

The contract system has tended to discourage the horse breeder of the country, as the money paid him by the contractor after much haggling, was often very little more than the cost of raising the horse. There has been no incentive for breeders, even in the best naturally endowed sections, to breed the type of horse that the Army needs.

Again, in recent years the demands for heavy draft animals for farming purposes, the high prices that these animals are bringing, the fact that they cost no more to raise and bring even a higher price although blemished, has had a further bad effect upon the breeding of the desired saddle type. Even before the present high prices of all horses and the higher price of the draft horse existed, the breeding of the type considered best for Army purposes received another severe setback by the adoption of electric and cable street railways and the extension of the trolleys. While not generally appreciated, the best "railroaders," as the horses used for street cars were called in the market, were the very kind that makes the best cavalry mount. This horse was desirable for street-car purposes because of his endurance and his willingness to work.

The contract system received its first serious setback, from the contractor's standpoint, when the Army, due to the clamor for better mounts, insisted upon a closer compliance with the contract specifications and rejected more of the horses presented by the contractor. The sudden rise in the price of horses further embarrassed the contractor, and the added difficulty of obtaining horses to present for inspection, caused many of the contractors to fail in their deliveries, made others reluctant to bid, later led to the impossibility of obtaining horses under this system in certain sections, and finally led to authority being given by Congress for open-market purchases. This method, while apparently a little more expensive to the Government, had the advantage of eliminating the middleman, giving the breeder all the money which the Government was willing to pay for horses, and giving the Government value received in horseflesh.

The establishment in 1908 of the remount depots has further improved the type of horse for the Army, as the system of purchasing young horses 3 and 4 years old, often unbroken, has enabled the Government to get the best type of horse before he has cost the breeder much money and when he could be sold for a reasonable amount. These horses, sent to the depots for maturity and handling, and finally issued to troops as 4½ and 5 year olds, while costing the Government more per head than the horses 5 and 6 years old formerly purchased and issued directly to troops, are very much better horses from the beginning, are properly developed at a critical period in their existence, rationally handled, and, when issued to troops, have been received with enthusiasm as a great improvement over

the matured horses formerly issued under the old system. Even considering the high market value of horses at present, it is believed that, under the remount system, horses can be issued to troops at not to exceed a total average cost of \$225. The latest contract price of cavalry horses is \$183.75; for artillery horses, \$213.75. Many of the late contract horses are young and require some handling at depots before suitable for service; others are mature.

Horses purchased as mature under the old system have had a useful life in the Army of 6.4 years on an average. The better grade of horses, such as are now being purchased, rationally developed and handled, should and will have a useful average life of 10 years. It is easy to see that the better horse issued from the depot at a cost of \$225 that last 10 years is cheaper than the horse costing from \$183 to \$213 lasting only 6.4 years. In addition the Army will have had a better horse throughout the entire period of usefulness. The horses being issued from the depots could undoubtedly be sold at time of issue at a handsome profit. Many individuals would bring fancy prices. It is needless to say that if it were possible to purchase them in issue form it would be necessary to pay much more than they have cost under the depot system.

European countries long ago found it not only advisable but necessary to supervise the breeding of horses in order to supply the demands of their Armies, and every European country of importance, with the exception of England, has for years been encouraging the breeding of the proper type of Army remount. England, one of the most important horse countries of the world, has for many reasons only recently been forced to this step. It is interesting to note that practically the same conditions confront England that confront this country at the present time, and that almost identical steps are contemplated in the two Anglo-Saxon countries to accomplish the same result—suitable Army horses in sufficient number.

A PLAN FOR BREEDING HORSES FOR THE UNITED STATES ARMY.

NUMBER OF STALLIONS REQUIRED.

From the best information available, it would appear that a comprehensive plan to breed the horses needed for the mounted service of the Army on the present peace footing should provide for not less than 2,000 horses a year and need not exceed an estimated allowance for over 2,500 a year.

To determine the number of stallions needed for this work, allowances must be made for failure of stallions to get in foal all mares served, for ordinary losses of foals, and for failure of foals bred to prove suitable for remounts.

A good sound stallion will get about 75 per cent of his mares in foal. Of the resulting foals, an average of at least 10 per cent will die from various causes before they are old enough to be purchased as remounts. In the proposed Army horse-breeding work probably about 50 per cent of the remainder would be suitable for remounts.

Based on an estimate of 100 stallions, the following results could be expected for varying numbers of mares served by each stallion:

Number of mares covered by each stallion.	Estimated number of suitable remounts by 100 stallions.
40	1,350
50	1,688
60	2,025
70	2,363

An estimate of 100 stallions would therefore appear to be conservative. It is doubtful if stallions average more than 70 mares a season, as a rule. In some localities it would probably be possible to stand stallions for a short fall breeding season in addition to the usual spring season, in which case a larger number of mares could be covered. In others only a spring season would be feasible, and a smaller number of suitable mares might be offered.

DISTRIBUTION OF STALLIONS.

The country should be divided into four or more breeding districts, as follows, and stallions assigned as indicated:

New England district (vicinity of Maine and New Hampshire) ..	10 Morgans.
Central district (Virginia, West Virginia, Kentucky, and Tennessee, with perhaps certain sections of Indiana and Ohio).	30 thoroughbreds.
	10 standardbreds.
	10 saddlers.
Southwestern district (vicinity of Missouri or Texas, with perhaps certain sections of Iowa).	5 thoroughbreds.
	5 saddlers.
	5 standardbreds.
Northwestern district (Montana, Washington, Oregon, and perhaps California).	15 thoroughbreds.
	10 standardbreds.
Total.....	100

It might be well to subdivide one or more of these districts. The above arrangement is worked out to establish such districts so that they will be in reasonable proximity to Government stations where the stallions may be kept between breeding seasons.

NUMBER OF REMOUNTS AVAILABLE ANNUALLY.

Based on the foregoing estimates, the number of remounts available yearly from these sections would be as follows, with stallions covering the maximum of 70 mares, and taking 24 as a convenient unit for the number of suitable remounts got by each stallion annually:

New England district.....	240 half Morgans.
	720 half-breds.
Central district.....	240 half standard breds.
	240 saddlers.
	120 half-breds.
Southwestern district.....	120 saddlers.
	120 half standard breds.
	360 half-breds.
Northwestern district.....	240 half standard breds.
Total.....	2,400

A considerable number of the horses sired by the Morgan and standard bred stallions would be suitable for cavalry remounts, but a much larger number would be preferable for the field artillery. The number of estimated remounts by Morgans and standard breeds is 840. In selecting stallions of these breeds due consideration should be given the necessity for artillery remounts.

SELECTION OF BREEDING DISTRICTS.

Those localities should be selected for breeding districts where conditions are especially suited to horse raising, where the type of mares is most likely to approach the type of horses desired for the Army, where a light type of horse will always in the long run be the most profitable to the farmer and draft horses least likely to gain a firm foothold, and where mares are sufficiently numerous to give the stallions maximum service. A careful survey of the horse-raising district of the country will be necessary before this question is settled, and the returns of the Thirteenth Census can probably be used. The Bureau of Statistics of the Department of Agriculture states that it is impossible to use its returns for this purpose. Perhaps, however, that bureau could assist in making the survey.

The Government reservations where stallions would be kept between the breeding seasons would be the points around which the work would center. In some cases it might be possible to stand some stallions on the central station itself. Stallions should be distributed in lots of five around the central stations, and such further distributions could be made as necessity required. At the close of the season they would be returned to the central station and kept there until the next, or sent to another locality.

THE EXPERIMENTAL FEATURE.

The plan has experimental possibilities of the highest order, which should be utilized. The leading features are the test of the value of different breeds to produce remounts, and the value of different soils and climates for the purpose, which could soon be determined by the Army by keeping records of performance. Certain troops, squadrons, and batteries, and even entire regiments, could be supplied with remounts bred in a certain way in certain localities, and the possibilities of the plan from an experimental standpoint would thus become very great. By the time a second large appropriation to purchase stallions would, if ever, be necessary the Government would be in possession of facts which would enable it to show definitely whether the plan had been successful and whether any crosses or localities should be eliminated from further consideration. It might be well, also, to consider the feasibility of arranging with the breeders to reserve a small number of high-class fillies each year for breeding purposes; otherwise mare owners would be compelled to replace their mares by purchase, which would bring the problem little nearer solution at the end of 20 or 50 years than it was at the beginning. That it is possible in time to fix the type desired for remounts is by no means questionable, and this may indeed be very desirable.

TERMS OF SERVICE.

No mare should be bred to a Government stallion until she has been approved by the proper officer as of the type suitable to produce remounts. The common unsoundnesses, the tendency to which may be transmitted from one generation to another, should naturally disqualify a mare, but even more important would be the necessity to refuse a mare on account of manifest faults of conformation, action, or quality.

The terms of service should be free, the owner of the mare entering into a contract to give the War Department an option on the resulting foal during the year it is 3 years old (estimating a horse to be 1 year old on the 1st of January after it is foaled) at a price to be fixed before the mare is bred. A provision should be included in the contract that the mare must remain in the owner's possession until the foal is weaned, and that, in case the foal is sold before the War Department has exercised its option, a service fee shall be exacted from the breeder of the foal. Provision should be made, however, to cover such emergencies as the death of the breeder, etc.

The price contracted to be paid for remounts should be fixed annually for each State by a board of arbitration before the breeding season opens, subject to the approval of the Secretary of War. For example, in January or February, 1912, this board would meet in each State mentioned above and agree upon the price to be paid for remounts bred in that State to be purchased in 1916; in 1913 prices to be paid in 1917 would be fixed, and so on. The arbitration board should be composed of an officer of the Army, an officer of the Department of Agriculture, and a citizen residing in the State, preferably a competent horseman. In purchasing remounts, no discrimination should be made against mares; colts should have been castrated at the breeder's expense, preferably between 1 and 2 years of age.

ORGANIZATION.

The breeding work would be administered by the Bureau of Animal Industry of the Department of Agriculture through the Chief of the Animal Husbandry Division. This division would direct the work under the supervision of the Chief of the Bureau, and keep the breeding records and the reports on the development of the foals. Not later than January 1 of each year it should furnish a report for transmission to the War Department on the actual number of 3-year-olds in each breeding district available for purchase during the year and the probable number of these that will make satisfactory remounts. A competent animal husbandman should be employed, with headquarters at Washington, as a traveling inspector of breeding stations, to keep the department in close touch with the work in addition to receiving regular reports from the breeding districts.

The men in charge of the breeding districts should be obtained from the field force of the Bureau of Animal Industry. These men should be good veterinarians with a thorough knowledge of horse husbandry. Their field experience would make them invaluable for this work, and the loss to the field service of the bureau would be more than compensated by the fact that they could handle the work better than

any men who might be obtained from the outside. If the Government undertakes this project it must do so under the most favorable auspices, and no risk of failure should be run. As success would largely depend on the ability of the men in charge in the field, the best men available should be obtained. The expert assistants to men in charge of breeding districts should be animal husbandry graduates of agricultural colleges, and not veterinarians. This would balance the service in a very effective way.

The duties of these men would be to direct the work at the breeding stations in their districts, to attend to the keeping of the records, to advise mare owners on the care of horses, and, if possible, to travel through their districts before the breeding season opens and approve mares, directing how they should be bred, if necessary. Until the work is on a thorough, well-organized basis the approval of mares should be done by the men in charge of districts or their expert assistants.

The men in charge of stallions as stud grooms should be employees of the Department of Agriculture, for whose appointment experience in the handling of horses should be the first consideration. Preference should be given men who had been honorably discharged from the mounted service of the Army and who presented certificates from officers in whose commands they had served showing their proficiency in horsemanship.

It is hardly necessary to point out the desirability of having the breeding service so organized that it will be carried on from year to year by the same or about the same corps of employees, in order that it may have a definite, stable, and continuous policy.

THE PURCHASE OF STALLIONS.

Stallions should be purchased by a board of three, composed of an officer of the Army, an officer of the Department of Agriculture, and a practical horseman, whose knowledge of breeds, pedigrees, and markets and whose integrity can be relied upon.

In selecting the stallions suitability for the purpose and freedom from unsoundnesses likely to appear in progeny should of course be first considered, and the stallions should be old enough to have shown their worth as sires of the class of horses desired. In buying standard-breds, saddlers, and Morgans, any tendency to pace, rack, mix gaits, paddle in front, or sprawl behind should disqualify, and only those stallions should be selected which come from families which show none of those tendencies to a marked degree. The presence of such faults in their get would of course disqualify them.

EXPENSE.

It is believed that this plan could be put into full operation at a cost not to exceed \$250,000 for the first year. This will allow for the purchase of first-class stallions with proved stud records and will provide for the employment of first-class men to carry on the work. The expense in subsequent years, on the same basis of 100 stallions, would require appropriations estimated at \$100,000 annually, which would allow for the replacing of stallions as necessity required.

On the basis of 40 mares per stallion the system would cost about \$40 per colt produced. If the maximum of 70 mares were covered

by each stallion, the cost per colt produced would be about \$20. Considering the fact that the normal stud fee in the country is from \$10 to \$25, with a probably average of \$15, it will be seen that under this system the expense would be somewhat greater than by using privately owned stallions, but it is believed that the advantages of breeding and the results in foals would more than compensate for the increase. While the increased cost would not necessarily be made up to the central Government, the increase in State and local taxes on more valuable foals would more than counterbalance the loss under this system. As a matter of fact the resultant cost of such a careful system of breeding can not be computed in dollars and cents, particularly as the effect of systematic effort in the breeding of army remounts should have such a favorable influence on all breeding in this country as to be of inestimable benefit to the horse industry and far outweigh any expense that might be debited against this system.

Mr. HAUGEN. What do you figure the cost of keeping a stallion for a year?

Mr. ROMMEL. It would cost approximately \$20 a month to keep him and stable him. We have a plan that would provide for the stables in units of 5 stallions with a groom in charge of each unit and with 2 laborers. We can probably get the groom at \$75 a month and the laborers at \$1.50 or \$2 a day.

Mr. HAUGEN. Would you ship the mares?

Mr. ROMMEL. We will take the stallions to the mares—let them travel around through the country, in sections where there is a large number of mares. That is a very common practice.

The CHAIRMAN. Does your plan give an estimate of the amount of money which would be required in the beginning?

Mr. ROMMEL. Yes, sir; that is suggested here. We estimate that it would \$250,000 the first year. That would include the purchase of 100 stallions. The figures for the second year would be less than that, not exceeding \$100,000 a year would cover it.

The papers submitted by Mr. Rommel follow:

WAR DEPARTMENT,
OFFICE OF THE QUARTERMASTER GENERAL,
Washington, February 5, 1910.

To the SECRETARY OF WAR,
War Department.

SIR: From the reports received from officers of this department engaged in the purchase of horses it is evident that the supply of horses fit for remounts is becoming more and more limited. From present indications it appears that this country is now in a position, with reference to horse supply, where it would be impossible to furnish, from its own resources, mounts for any considerable or sudden increase in the mounted arms of the service, and is fast reaching a point where the needed supply of suitable remounts for the present strength of those arms will be extremely difficult to obtain if in fact at all obtainable.

It is noted from certain publications of the Department of Agriculture that that department is now actively engaged in the development and encouragement of horse breeding and horse raising along certain lines. In this connection this office would be glad to know whether the Department of Agriculture has given or contemplates giving any attention to the development of horses suitable for the mounted service of the Army. If any such project is under consideration or in contemplation by the Agricultural Department, this office would be glad to be given opportunity to cooperate in all ways it can, considering the statutory limitation that has been placed upon its activities in the direction of breeding. While this department may not use any of the appropriations at its command for breeding purposes, it is believed much could be accomplished through consultation with officials of the Agricultural Department in immediate charge of this work and through giving attention to purchasing horses that have been bred so as to produce remounts, thus assuring to all horse raisers who

may take an interest in breeding horses of this class that the War Department will be ready and willing to take those produced which are suitable without leaving them to the uncertain and less profitable method of selling them to contractors.

It is recommended that the Secretary of War communicate with the Secretary of Agriculture with a view to learning what, if any, action is contemplated by the Department of Agriculture along the lines above mentioned and with a view to arranging for cooperation, if anything is to be undertaken.

Very respectfully,

J. B. ALESHIRE,
Quartermaster General, U. S. Army.

[First indorsement.]

WAR DEPARTMENT, February 7, 1910.

Respectfully referred to the honorable the Secretary of Agriculture, with request for his views on the suggestion herein presented by the Quartermaster General of the Army.

J. M. DICKINSON,
Secretary of War.

[Second indorsement.]

DEPARTMENT OF AGRICULTURE,
February 10, 1910.

Respectfully returned to the honorable the Secretary of War. Horses in the United States are dearer than they have been, but if, in an emergency, the War Department needed a considerable number, there is no doubt the horses could be had, although a higher price would have to be paid. The Department of Agriculture has set about the production of a better horse in the mountain States of the West. A plant is maintained in Colorado, where an endeavor is made to show people how to breed better and feed better, so as to produce a better horse. The price paid by the army would not induce anybody to breed for army purposes, but the Department of Agriculture expects, eventually, to distribute better stallions throughout the mountain States, from which, undoubtedly, will come horses suited for army purposes; horses that might not be so well suited for high-priced roadsters, hunters, or coach horses.

The Department of Agriculture will be glad to consult with officers of the War Department on this subject at any time.

JAMES WILSON,
Secretary of Agriculture.

A true copy:

F. G. KELSEY,
Acting Chief Clerk.

WAR DEPARTMENT,
Washington, March 11, 1910.

THE SECRETARY OF AGRICULTURE,
Washington, D. C.

SIR: Referring to the inclosed copy of a letter of the Quartermaster General and your indorsement thereon, I desire to state that so far as concerns the type of horse required for the mounted service of the Army, and the course of breeding necessary to produce it, no idea is entertained that the Department of Agriculture is in need of consultation with the War Department or any of its bureaus. On the contrary the War Department might expect to profit by the counsel and advice of the Department of Agriculture in such matters, and would feel impelled to seek the same if in position to take any action with reference to breeding.

The object of this department is to find a way to be enabled to make the first offer of purchase of horses suitable for remounts, bred as indicated in your indorsement, and with a view to working out a plan of cooperation to that end, I would be pleased if you would designate a representative of your department with whom a representative of the War Department, whom I will designate, can take up matters of detail. It is understood that in several European countries state encouragement of the production of suitable horses for army uses has been found necessary, and that while the actual superintendence of breeding is done by the agricultural departments or ministries, the army horse-supplying agencies are intimately connected with and assist in the encouragement through action similar to that which I am asking you to consider. If a general policy be agreed upon along the line suggested it is thought the details may be easily worked out.

The prices heretofore paid by the Quartermaster's Department for remounts, to which you refer in your indorsement, are believed to be logical results of the bid sys-

tem of purchasing animals, which was practically the only way in which they were purchased until within the last two years, and which still prevails to some extent, but is being less used as the remount system is developed, whereby young animals are purchased direct from owners and trained and conditioned at remount stations before being issued to troops. Contractors will bid low, and if properly guaranteed, the lowest bid must be accepted in compliance with statutes. The successful contractor will then buy the cheapest horses he can, approaching the requirements of the specifications, and endeavor to secure acceptance thereof. The Quartermaster General is convinced, from experience during the short time elapsed since the establishment of the present remount system, that the department can purchase young horses direct from horse raisers at prices of advantage to them and to the Government. He also believes that through this means the cooperation of horse raisers with the plans of your department, as they appear to him, can be stimulated, resulting in benefit to all concerned. His representations and the data he has submitted lead me to believe that he is correct in his views.

If you can agree with me, that arrangements are practicable, similar to those in vogue in European countries, whereby the agricultural or similar department superintends the breeding of horses, and the Army makes purchases from among those so bred, I think all that remains to be done is for each of us to designate representatives from our respective interested bureaus to get together and formulate plans, taking into consideration the allowances that must be made for our form of government and existing laws.

Very respectfully, yours,

J. M. DICKINSON,
Secretary of War.

A true copy:

F. G. KELSEY,
Acting Chief Clerk.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, March 17, 1910.

The SECRETARY OF WAR.

SIR: In reply to your letter of the 11th instant, regarding the breeding of horses for the mounted service of the Army, I have the honor to state that this department will be very glad to undertake such work if Congress supplies funds for the purpose.

I note your suggestion that I designate a representative of this department with whom a representative of the War Department can take up matters in detail and formulate plans. I will designate for this purpose Mr. Geo. M. Rommel, Chief of the Animal Husbandry Division of the Bureau of Animal Industry, who is in immediate charge of the horse-breeding work now conducted by this department. Mr. Rommel will meet your representative at such time and place as may be most convenient.

I have the honor to be, sir, your obedient servant,

JAMES WILSON,
Secretary.

A true copy:

F. G. KELSEY,
Acting Chief Clerk.

WAR DEPARTMENT,
Washington, March 22, 1910.

SIR: I have the honor to acknowledge receipt of your letter of 17th instant, informing the department that Mr. Geo. M. Rommel, Chief of the Animal Husbandry Division, Bureau of Animal Industry, will represent the Department of Agriculture in connection with the subject of formulating plans regarding the breeding of horses for the mounted service of the Army.

In reply, I beg to advise you that Capt. Caspar H. Conrad, jr., has been designated to act, under the direction of the Quartermaster General, with the Department of Agriculture in arranging the necessary details for cooperation in this matter. As soon as this officer reports to the Quartermaster General he will be assigned to duty in connection with purchases of remounts.

Very respectfully,

ROBERT SHAW OLIVER,
Assistant Secretary of War.

The SECRETARY OF AGRICULTURE.

A true copy:

F. G. KELSEY,
Acting Chief Clerk.

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, July 8, 1910.

SIR: Referring to the correspondence had during February and March last with your department concerning the breeding of horses by this department for the mounted service of the Army, I have the honor to inclose herewith a plan which has been worked out by Mr. Geo. M. Rommel, Chief, Animal Husbandry Division, Bureau of Animal Industry, and Capt. C. H. Conrad, jr., of the Quartermaster General's Office, the officers of the respective departments designated for this purpose. This plan has the approval of the Chief of the Bureau of Animal Industry of this department, and has been informally submitted to officers of the Army stationed in Washington. The criticisms made by these officers have been embodied in the inclosed plan.

The plan is now formally submitted to the War Department for such official action, suggestions, or criticisms as may seem proper. If the plan as inclosed is approved by the War Department, the Chief of the Bureau of Animal Industry will recommend to the Secretary of Agriculture that an item of \$250,000 be included in the estimates for expenses for the next fiscal year, with which to begin the work of breeding horses for the mounted service of the Army along the lines therein presented.

I have the honor to be, sir, your obedient servant,

WILLIS L. MOORE,
Acting Secretary.

The SECRETARY OF WAR.

A true copy.

C. C. CLARK, *Chief Clerk.*

WAR DEPARTMENT,
Washington, July 12, 1910.

SIR: I have the honor to acknowledge receipt of your letter of 8th instant, and to advise you that the accompanying plan for breeding horses for the United States Army meets with the entire approval of the department. It is therefore requested that you will have the kindness to insert an item of \$250,000 in the estimates, as indicated in your communication, in order that the scheme may be carried into effect as outlined.

In this connection the department desires to express its appreciation of the hearty cooperation of the Department of Agriculture in this matter.

Very respectfully,

ROBERT SHAW OLIVER,
Acting Secretary of War.

The SECRETARY OF AGRICULTURE.

A true copy.

C. C. CLARK, *Chief Clerk.*

DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, July 18, 1910.

The SECRETARY OF WAR.

SIR: I have the honor to acknowledge receipt of your letter of the 12th instant returning the plan for the breeding of horses for the Army with the approval of the War Department. As intimated in this department's letter of the 8th instant, the Chief of the Bureau of Animal Industry will insert an item of \$250,000 in his estimates, and as soon as the Secretary returns the matter will be formally placed before him.

I have the honor to be, sir, your obedient servant,

W. M. HAYS,
Acting Secretary.

A true copy:

C. C. CLARK,
Chief Clerk.

(Thereupon the committee adjourned.)

COMMITTEE ON AGRICULTURE,
HOUSE OF REPRESENTATIVES,
Wednesday, January 25, 1911.

The subcommittee met at 10.15 o'clock a. m., Hon. Charles F. Scott (chairman) presiding.

There appeared before the subcommittee Hon. James Wilson, Secretary of Agriculture; Hon. Leonidas Livingston, of Georgia; Dr. Harvey W. Wiley, Chief, Bureau of Chemistry; and Dr. Alonzo D. Melvin, Chief, Bureau of Animal Industry, Department of Agriculture.

The CHAIRMAN. By direction of the Committee on Agriculture, the subcommittee, which is now here present, Mr. Haugen, Mr. Chapman, Mr. Lever, Mr. Beall, and the chairman, have met this morning to consider House resolution 875, offered by Mr. Livingston, of Georgia, which is as follows:

That the Secretary of Agriculture is directed to ascertain and report at the earliest practicable day and as accurately as possible the quantity and value of staple articles of food, such as beef and mutton, and light articles of food, such as poultry, eggs, and fish, that are in cold storage in the United States, and the length of time each such article has been in cold storage; this information being required with a view to the consideration by Congress of the enactment of laws limiting the storage of such articles for more than forty days prior to offering the same for sale and consumption.

The committee was of the opinion that the information and advice which could be afforded by the Secretary of Agriculture, by Dr. Wiley, the Chief of the Bureau of Chemistry, in charge of the enforcement of the pure-food law, and by Dr. Melvin, Chief of the Bureau of Animal Industry, who is familiar with the supplies of beef and mutton in the country, would be of value to the committee, and we have therefore invited those gentlemen to be present, and we appreciate their attendance. We also invited the author of the resolution, Mr. Livingston, to attend, in order that any questions he desired to ask might be considered. I believe I will ask Secretary Wilson first to express to the subcommittee his judgment of the advisability of adopting this resolution, speaking particularly to the question as to whether he thinks his department would be able, in any reasonable time, and at a reasonable expense, to give to Congress the information asked for in the resolution.

Secretary WILSON. We have a list of all the cold-storage houses in the country. But that only tells us where they are; it does not tell us what they have inside. We have people connected with over 900 packing houses, and these people can get you this information. It will take some little time to get it, but it will not cost anything.

The CHAIRMAN. Would they be able to ascertain from the proprietors of these cold storage plants how long the contents had been in storage?

Secretary WILSON. They might refuse to tell one of our people; they might refuse to show the books.

The CHAIRMAN. It is a matter of common knowledge that many millions of eggs, for example, are packed away in the storehouses in

all the cities, but it is hardly to be anticipated, I am afraid, that the owners of those eggs would at once make a clean breast of the matter and disclose to any inquirer, even to an official inquirer, the length of time the products had been in storage. Mr. Livingston was reading this morning, before the committee convened, a statement from a newspaper, in which it seemed to be pretty clearly shown that in a certain city eggs had been stored for at least four years which are now being placed upon the market as strictly fresh eggs. It could hardly be expected that the man who controls those eggs would admit that they had been in storage for four years, and I would just like to have the Secretary's idea as to how he would go about it to check up the matter.

Secretary WILSON. We could not get it, Mr. Chairman; we could not get it altogether. They would not tell us. But we would do this: We could send out circulars to our people and have them inquire. We would get the information from some of them; from some others we would not. No one could compel them, except a committee of Congress with power to send for persons and papers. We can let them understand that if they will not let us have that information probably Congress will be compelled to get the facts; that Congress will appoint committees with power to send for persons and papers and to receive statements. I do not think we can get you detailed information in time for you to do anything this session of Congress.

The CHAIRMAN. That is hardly to be expected.

Secretary WILSON. I do not think we can. It would take a month, Dr. Melvin?

Dr. MELVIN. At least.

Secretary WILSON. We could probably, in a month, get you a great deal of the information if the people would tell us.

The CHAIRMAN. You could at least send to Congress a list of the cold-storage plants in the country?

Secretary WILSON. We have that now.

The CHAIRMAN. With perhaps an approximation of the quantity of different products in storage. It would not be so difficult, I apprehend, to learn the quantity of any particular product, as it would to learn the length of time it had been in storage.

Secretary WILSON. It depends a great deal on what the product is. It is a good thing for meat to be hung a while in cold storage; it improves it. With regard to some other things, undoubtedly they should not be held there so long, because they begin to deteriorate. But I was thinking if Congress desires, we can set an inquiry on foot; we will get facts with regard to a good many of the cold-storage houses, and what they have. If we could get 10 per cent of them, we could get an approximation as to how much stock is probably in the whole number. It will not cost much. These men are paid now. They got us what information I have been reporting in the last two years with regard to meat products. It has not cost us anything worth speaking about. These people will do a little extra work like that if we ask them to do it; and do it outside of hours.

The CHAIRMAN. You think you would need no special appropriation for this work?

Secretary WILSON. What do you think of that, Dr. Melvin?

Dr. MELVIN. I do not think we would.

Secretary WILSON. I think we could do it without any extra appropriation.

Mr. LEVER. Could you get facts upon which we might base a reasonable proposition of law?

Secretary WILSON. You say we can get the facts?

Mr. LEVER. Can we?

Secretary WILSON. We can get what we can. That would not be complete, but it would be indicative. If 10 per cent of them tell us what they have and how long they have had it, it would be indicative. I think we would have to fix a date.

The CHAIRMAN. The resolution, by its terms, among other things, simply asks for information as to the quantity and value of various products that have been in cold storage more than 40 days. It does not ask you to show the actual length of time it has been in storage. All you would be required by the resolution to ascertain would be the quantity and value of products that have been 40 days or more in storage.

Mr. LIVINGSTON. That 40 days, of course, was a mere guess as to the time that we ought to have inserted in the resolution. If the cold-storage warehouses are affecting the prices of eatables to any great extent, it is owing simply to the length of time they are kept there and kept off the market; and as a basis for the Secretary to form some idea to what extent the withholding of products in cold storage influences the market prices, he ought to know something about the time they are kept in there. If they go in to-day and out to-morrow it would not influence the market; if they go in to-day and stay in a year it would influence the market.

The CHAIRMAN. Would it influence the market materially if they stayed in only 40 days? Have you not fixed rather a narrow limit of time, having in view this consideration, which I think Congress would take into account if it ever enacted legislation along this line—that is, the question of the length of time which products may be kept in cold storage without deteriorating in wholesomeness or food value?

Mr. LIVINGSTON. That is the other idea in my resolution. There were two things I wanted to know.

The CHAIRMAN. And it is for that reason particularly that I thought we would like to have Dr. Wiley come this morning to give us his opinion as to whether there is any product, which by common report is kept in cold storage in large quantities, which deteriorates to such a degree in cold storage within the limit of 40 days as to make it unwholesome or detrimental to the public health. Will you give us your opinion on that, Dr. Wiley, so far as you are able to form one with the information you now have?

Mr. LIVINGSTON. Before the Doctor gives it, I want to ask this to make it specific: How long can goods be kept in cold storage without deteriorating? The Secretary has intimated you can keep meat there much longer. But the 40 days covers the most perishable articles that can be put in, and that is one reason why I put in 40 days. A general statement from our chemist here as to food products would not answer the purpose.

The CHAIRMAN. I expected that the Doctor would name specifically the products, which, as I said, by common report, are held in quantities in cold storage, and would express his opinion upon each one of them.

Mr. LEVER. Before Dr. Wiley begins, let me ask Col. Livingston if he does not think this kind of an amendment would make his resolution stronger:

That the Secretary of Agriculture is directed to ascertain and report, at the earliest practicable day and as accurately as possible, the quantity and value of staple articles of food, such as beef and mutton, and light articles of food, such as poultry, eggs, and fish, that are in cold storage in the United States, and the length of time each such article has been in cold storage—

cutting out the 40 days?

Mr. LIVINGSTON. I apprehend trouble in getting that. The Secretary relieved my mind to some extent when he said that when they get 10 per cent they could form an idea.

The CHAIRMAN. Allow me to suggest that it would be an almost endless task, because in the same cold-storage plant you would find some articles that had been there 50 different lengths of time.

Mr. CHAPMAN. You would have to specify a certain date in that resolution, too, on which to begin counting.

The CHAIRMAN. Will you be kind enough to take up the question I suggested, Dr. Wiley?

Dr. WILEY. Mr. Chairman, the Bureau of Chemistry has been investigating now for four or five years the changes bacteriological and chemical, and the organoleptic changes which occur in various food products stored in refrigerated warehouses with a view of determining the nature of the changes which they undergo, their extent, and their possible influence upon health. We have published a number of bulletins and documents on this subject and have still a great deal of material not yet published relating to the same subject.

I can answer categorically most of the questions which you have propounded. As far as fish, butter, and eggs are concerned, they begin to deteriorate at once, wherever they are kept.

The CHAIRMAN. And about what length of time would you fix as a reasonable limit?

Dr. WILEY. That is a question which is impossible, I think, to be decided, to set any definite limit. But the limit which would first be thought advisable would be the one which we all are interested in, and that is the taste and flavor of the goods, aside from any deterioration of an invisible kind, or one of the kinds not obtainable by the ordinary senses.

In the first place, Mr. Chairman, the principal thing is the condition in which these bodies are when they go into cold storage; and I will say this in favor of cold storage, that a great deal of the objection to cold storage is not legitimately against cold storage per se, but against the character of the goods which are brought to the cold-storage warehouses. Too often is it the case that goods which are already passé and can not be sold on the stands are sent into cold storage. Those goods are bad when they go in and naturally they do not improve after they go in. They deteriorate much more rapidly than fresh goods.

Mr. LIVINGSTON. In the country we buy our eggs in June, July, and August and ship them to cold storage. That is very warm weather, and in transit they must not be in proper condition, in my opinion, to go into cold storage.

Dr. WILEY. That is just the condition of affairs I refer to.

Mr. HAUGEN. They are shipped in refrigerator cars, are they not?

Mr. LIVINGSTON. No; I do not think so.

Dr. WILEY. Eggs are frequently put into cold storage in an unfit condition, and the Bureau of Animal Industry, as well as our bureau, is making a campaign to secure fresh material for cold storage, and when we can get absolutely fresh material in cold storage we will have already prevented the most serious objections to the practice for any length of time, so far as deterioration is concerned.

Eggs may be taken as the typical subject which will illustrate all the others. The egg is kept at as low a temperature as can be without freezing, in the neighborhood of 32° F., and in that condition the changes which take place in the egg are comparatively slow. They consist, first, in evaporation of water through the shell, even at that temperature, and thus an increasing air space, or open space, within the shell is produced. This renders the egg for its volume less heavy, and makes its specific gravity less. That is the one test first of all by which you can distinguish a fresh egg from one that is stored, its specific gravity. I illustrated that point to the committee once, by taking eggs which we knew to be fresh, having gathered them ourselves, and showing that in a certain salt solution those eggs will all sink; while other eggs, bought from the stores around here, would float, and the amount of shell that sticks up is a very good indication of how long they have been kept. The longer they have been kept the more of the shell shows above the water. There is no question, therefore, that a storage man may be able at once to distinguish the eggs that are fresh. A simple test like this is entirely sufficient and can be done on a large scale with very little expense.

Another test is the candling test, as you know. That, however, does not distinguish between a fresh and a stored egg. It distinguishes between a homogeneous and a heterogeneous egg. When the egg begins to segregate and form lumps or spots, as it does when it starts to incubate, then the candling will show that. Most producers of eggs prefer sterile eggs, those that have not been impregnated, because they keep better. They do not allow the pullets to run with the roosters at all, so that the eggs are sterile; they will not hatch, and those eggs keep longer. They are the best market eggs. But as long as they are homogeneous and show an even light through candling, they are considered good, although they may be old eggs. They are not suitable for consumption.

The CHAIRMAN. Can the deterioration among the sterile eggs be determined at all by candling?

Dr. WILEY. Oh, yes; but not the ordinary deterioration; not the formation of a germinal spot. That never occurs as it does in the impregnated egg. But there is a spot after awhile.

The CHAIRMAN. But that can be detected?

Dr. WILEY. Yes; detected by candling. But it is not due to incipient growth, which does not take place at all. As Mr. Livingston said, the spring is the time when eggs are abundant. The farmer, in the first place, needs to be instructed that he must gather his eggs every day and put them in the coldest place he has about the house, if he does not market them every day—in the cellar or somewhere; and if you have artificial refrigeration in the house, which most farmers do not have, that is the best place. But I have often seen that they would not gather the eggs until there were five or six in the nest, and meanwhile the hen warms them up and they are starting in

incipient growth. Those are not suitable to be put into cold storage. When fresh eggs are brought into cold storage and kept at the proper temperature, they may be kept, as far as our examination shows, many months without any such deterioration as will materially interfere with their taste or show any marked degree of decomposition due to any kind of chemical changes that go on therein.

Mr. HAUGEN. About how many months can they be kept?

Dr. WILEY. I should say that an egg which is put in in April and May, and properly handled on the farm, may be kept nine months with perfect safety. When Congress does legislate on these matters it should prohibit the cold storage of eggs that are produced in July and August. It should be absolutely forbidden that they should go into cold storage, because it is absolutely impossible, in this warm country of ours, in my opinion, to get those eggs to a cold-storage plant, unless it is on the farm itself, in a suitable condition to put away, and the ordinary egg months are April, May, and June, and all the eggs that are necessary to be put into cold storage can be collected during those months. Put it a month earlier in the South and a month later in the North; March, April, and May, perhaps, in the South; April, May, and June in the middle of the country, and possibly May, June, and July farther north. But that is the important thing, Mr. Chairman, that these things shall go into cold storage in a fresh state.

In regard to butter, I will say that I never have seen yet, to my knowledge, a package of butter that is kept over, for instance, from early last June until now that does not show it in its state. I think I could tell it every time. But I would not say that butter was unwholesome. I would simply say it had deteriorated to that extent. But I think that butter, like eggs, may be kept from six to nine months. Fish is more sensitive than either of the others. In my opinion, fish should never be kept for any purpose except to get them off the market and should never be allowed to be sold out of their season, nor should the products of last season, as is the case now, be sold for the products of this season. You can get cold-storage shad on the market to-day, kept over from last spring, wholly inedible, in my opinion, and dangerous, because, while eggs and butter do not tend to produce poisonous decomposition products, as a rule, fish do. Fish is the most dangerous food for man that is kept. Fish is the one food that should always be used fresh, if possible, on account of its dangerous decomposition products.

The CHAIRMAN. How about oysters? Are they apt to develop ptomaines?

Dr. WILEY. I include oysters with fish—oysters, crabs, lobsters, and all shellfish, as well as ordinary fish.

Secretary WILSON. You would exempt salted fish?

Dr. WILEY. Oh, yes; I am not speaking of cured meats at all, or fish, especially, which can be cured perfectly and kept well without any danger at all by the ordinary curing processes. I am only speaking of fresh fish that are kept without any addition of any spice or salt, or anything of that kind.

Mr. CHAPMAN. What about poultry?

Dr. WILEY. Poultry is a thing we have studied especially. The poultry problem is one of the most important, next to the supply of milk, to my mind, in the country. Poultry is a product which ought

to be served fresh. You can have chickens on the market every day in the year; they are on the market every day in the year, and there is little excuse for having all your chickens hatched at one time with the modern methods of production. You can distribute the production of chickens right along through the year, a man who is a professional chicken raiser, without much trouble, and the ideal way of bringing chickens to the market is alive, and when they are brought alive, they should not be killed, but they should be put into quarantine, you might say, at the place where they are to be slaughtered, properly fed, all diseased fowls removed, and killed and sold fresh. But you can keep them in cold storage, drawn or undrawn. There is a great deal of prejudice in this country against an undrawn chicken, which is not wholly justified. I would make this rule about a chicken that is packed undrawn, that it must not be fed 24 hours previous to the time of slaughter. If you will make that rule you do not need to draw your chickens at all. You have the ideal way of keeping the chicken, with its craw empty. On the contrary, a man came to me the other day with a pound and a quarter of corn from the craw of a turkey he bought, that turkey having been fed corn at a cent a pound and they got 25 cents a pound for the turkey, which is a pretty good price. That ought not to be allowed in a fowl that is fresh. The man who buys your cattle on the hoof makes an agreement with you that you will not feed those cattle the day he buys them. He wants to get them with practically an empty stomach, so that he does not have to pay for the food. So we can say to the people who are going to put chickens in cold-storage warehouses that they must not feed them within 24 hours.

Mr. CHAPMAN. How about game, rabbit, prairie chickens, quails, and things like that?

Dr. WILEY. Those things are always supposed to be better when they are tender. That is a problem for the connoisseur. There is so little of it that I do not think it is proper to complicate this subject with that idea. Another thing is this, while I have no positive knowledge, or statements, I have information which leads me to believe that the butter and the eggs which are produced now are going into cold storage in order that they may sell the cold-storage products of last spring and summer. That is something that ought to be forbidden by law. There is a certain season in which you can put eggs in cold storage, and you ought to forbid it in any other season; there is a certain season in which you can put butter in cold storage, and you ought to forbid that in any other season; and so on, so that the things that do come fresh may come to the consumer fresh and not be put aside in order to make way to sell the old stuff. I do not put much confidence in the newspaper stories about four, seven, and eight year old eggs; but there may be possibly some such instances.

In my opinion cold storage is the greatest blessing, almost, to the people of this country, when properly controlled, and all we want to do is to eliminate the abuses. If it is used to control prices, if it is used to force a sale, if it is used to prevent fresh foods in their season from coming on to the market, then that is an abuse. When cold storage is used in order to present food in a good state to the consumer, in the best state possible, to hold over from times of extreme plenty to

times of extreme scarcity, it seems to me it should be promoted and favored.

The CHAIRMAN. Do you suggest any different length of time as the limit for obtaining the information asked for in this resolution, or do you think 40 days is about right?

Dr. WILEY. I think that is about what is necessary. All you want to know is what is in cold storage 40 days and over. That brings it out and does not complicate the matter. It would be almost impossible to get the amounts in each warehouse in time. The Secretary said it could be done. But this is a simple proposition, and it seems to me it covers the ground pretty well.

Mr. HAUGEN. You did not touch on meat, I believe?

Dr. WILEY. I have nothing to do with meats; I do not handle those at all.

Secretary WILSON. Before you leave the butter question, Doctor, I would like to say that butter keeps in proportion to the extent to which you have taken the buttermilk out of it. I recollect during the great exposition in Philadelphia I was called upon by the secretary of agriculture of Denmark, where they ship lots of butter to Great Britain. I said, "How often do you work your butter before you ship it?" He said, "Once." In a few days I had the secretary of agriculture from Finland. I said, "Where do you sell your butter?" He said, "Oh, in Great Britain." I said, "How often do you work it?" He answered, "Twice." "Well," I said, "I had the secretary of agriculture from Denmark a few days ago, and he said they worked theirs once." He answered, "Ah, yes, but it takes us in Finland one day more to get our butter to Great Britain, and butter will become rotten at its prime, owing to the development of bacteria; and bacteria develop owing to the amount of buttermilk you have there. They can not develop to any great extent where the buttermilk is all out." The Dutch woman, in making butter, works it not only once or twice, but she works it eight or ten times, and she does not have a butter worker there. She takes it up and goes at it that way [indicating], and she works it eight or ten times over, and then puts it in a keg and heads it up, and it goes over the Tropics, over the Tropics again, and back to Holland, in good, sweet shape, because the buttermilk is all taken out. If we are fixing a length of time that the butter might be put into cold storage, we want to have something said about the way it was worked.

The CHAIRMAN. Of course, this committee is not considering at this time the question of framing a law in relation to cold storage, and so these are details that we will not need to consider now. We are simply inquiring as to the practicability and advisability of attempting to get this information. Are there any questions which members of the committee or Mr. Livingston wish to ask the Secretary or either of the other gentlemen? If not, I think we have information enough on which to base a judgment in relation to this resolution.

Mr. LIVINGSTON. Mr. Chairman, if you will pardon me a moment, I wish to make a statement.

The CHAIRMAN. We will be very glad to hear from you, Mr. Livingston.

Mr. LIVINGSTON. The adoption of this resolution, as it is, or amended as you may see fit, would put the world on notice that

Congress is looking into this matter. The testimony of Dr. Wiley and the Secretary here this morning, if it goes abroad, will have a good effect all over the country. These cold-storage people will begin to take notice. We have got to stop people putting eggs in cold storage in July and August, and get that out of their minds.

You get the idea from Dr. Wiley's statement that fish is easily deteriorated and soon becomes dangerous to your stomach, and they will get the same idea as to eggs that are improperly put in cold storage, and butter that is improperly put in cold storage, and it will work up an interest all over this country. Even if Congress can not handle this legislation, if the report comes back too late for Congress to handle it, the simple fact that Congress is looking into it will make the municipal authorities of the cities more careful, and they will look into it. There were over 100 dozen eggs in Atlanta destroyed last week. This resolution of mine was published, and an article I wrote was published down there in Atlanta. They are doing it in other cities also. We look for a great good that will be accomplished, even if we do not get the detailed facts as we want them. It will be a beginning, and I would hate to see the 40-day limit changed. It is an average date, certainly, when eggs in a certain condition ought to be kept, and when fish ought to be kept, and when butter unworked ought to be kept. If they go into cold storage, as Dr. Wiley states, in an improper condition, they ought to get out of it. Forty days is long enough to keep them.

Secretary WILSON. Just one point there. If we are going to work right away to visit those cold storage houses, I am a little afraid your proposition will put them on their guard.

Mr. LIVINGSTON. Let them be on their guard.

Secretary WILSON. We would rather to get the facts before they think much about it.

Mr. LIVINGSTON. They know about this resolution. You can not slip up on them.

Mr. LEVER. You would have the authority now, Mr. Secretary, without this resolution to make this investigation?

Secretary WILSON. Oh, yes, just the same. I think we would have just about as much authority without the resolution as with it. But the question turns on compelling them to answer and to let us see their books.

The CHAIRMAN. You are authorized by the current appropriation act, and a similar provision has been included in the act for next year, to continue your investigation into the cost of living. I presume that under that authority you would be——

Secretary WILSON. We will continue that next summer.

The CHAIRMAN. Under that authority you could get the specific information that is asked for here, even if this resolution should not happen to be reached?

Secretary WILSON. We could.

Mr. LIVINGSTON. But the general public will not be satisfied with that kind of a general transaction. The people are stirred up about this cold-storage business. There are too many people dying of acute indigestion, men who are healthy, and always have been healthy, dropping on the street, sending for doctors for acute indigestion every day, and the idea is that our food products are not in shape

and we do not want any general authority to do it; we want the specific authority as to this matter.

Mr. HAUGEN. I would like to ask Dr. Wiley a question. I believe you stated a year or two ago to the committee that you were engaged on some investigations and experiments as to how long beef and mutton should be kept in cold storage. Can you give the committee any information as to that?

Dr. WILEY. The authority to continue that investigation was put out of the bill on a point of order when it was before the House two years ago, and we have not continued that series of work since that time, because the authority which was specifically given in the former bills was thrown out on a point of order. But we have continued investigations in a general way in determining the character of food and the changes which take place; but we have not since that time put anything into cold storage ourselves.

Secretary WILSON. One point you ought to know. As soon as Mr. Livingston introduced this it came down to us and Dr. Melvin and I held a consultation about it and concluded we had better go to work and get that and not wait a minute. Your time is short in this session, and so our people are at work now getting this information. We push them right along whether Congress can use it or not. If it can not, we will report it anyhow.

Mr. HAUGEN. I would like to hear Dr. Melvin. How long can beef and mutton be kept in cold storage without deterioration?

Dr. MELVIN. Our bureau has not done very much work on that question itself. We have been reviewing the literature regarding other investigations that were made, and are now preparing to equip a refrigerating plant so that we can buy these kinds of meat and put them in refrigeration for various lengths of time under different conditions of humidity, etc., and make a subsequent report. I presume that will occupy, to be complete, two or three years; maybe longer than that to finish it up entirely. But, as Dr. Wiley has stated, and as is generally known, the length of time which refrigerated products can be kept depends largely on the condition in which they are put into the storage plants, and by storage I mean freezers, not the ordinary refrigerators. If beef is fresh and has been properly chilled and placed in cold storage it can be kept very well from nine months to a year, which is about as long as it is ordinarily kept; that is, the frozen products.

Mr. HAUGEN. That is, without deterioration?

Dr. MELVIN. Yes.

Mr. HAUGEN. Eight or nine months?

Dr. MELVIN. From nine months to a year.

Mr. HAUGEN. All of it is under your supervision, is it not?

Dr. MELVIN. Yes.

Mr. HAUGEN. And all of it goes direct from the block to the cold storage or to the coolers?

Dr. MELVIN. I will not say all of it; of course it is all under my supervision, if we should carry the supervision to that extent. In some cold-storage warehouses we do not have inspectors located. The meat that they receive has all been properly inspected and it is in proper condition when they receive it.

Mr. HAUGEN. It goes direct from the block to the cooler in the establishment itself, and is shipped from there to the storage plant in refrigerator cars, is it not?

Dr. MELVIN. Yes, sir. The bulk of the beef and mutton is kept in warehouses that are controlled by the establishments that have inspection and are under our supervision.

Mr. HAUGEN. The smaller firms do not ship any to cold storage?

Dr. MELVIN. Not very much. They may, in some seasons of surplus, put some parts of their products in cold storage for a time. But that is no great amount.

Dr. WILEY. Mr. Chairman, I would like to say just one thing, that one of the chief abuses, one of the most important abuses of cold storage, is to take things out of cold storage, expose them for sale, and then if they are not sold, send them back. A cold-stored product when once thawed deteriorates with a great deal more rapidity than a fresh product of the same kind. It kills the vitality of the meat, for instance, or the egg, to chill it so long, and when it is warmed up once and offered for sale it decomposes and deteriorates with amazing rapidity, and if it is not sold within a day or two it is apt to get bad, and they send it back and refreeze it.

Mr. HAUGEN. All of it goes to the cooler or the refrigerator; it is not sold right from the block after it is killed?

Dr. MELVIN. Not as a rule.

Mr. HAUGEN. It is necessary to put it in cold storage for a certain length of time?

Dr. MELVIN. That is the general custom.

Mr. HAUGEN. For how long a time? It makes it more palatable, does it not?

Dr. MELVIN. I think that probably 95 per cent of the meat that is eaten fresh is sold within a few days of killing. Ordinarily they let it hang for a few days in the cooler and then it is shipped to the various points and placed in refrigerator boxes at the local dealer's, and he in turn cuts it on the block. I think perhaps 95 per cent of the fresh meats are disposed of in that way.

Mr. HAUGEN. How long should it be kept in cold storage, or a cooler, before it is sold?

Dr. MELVIN. Most of it is sold, probably, within from a week to three weeks. Boxes of meat killed in these large centers are shipped great distances away; for instance, from Chicago or Kansas City to Boston and eastern points, in refrigerator cars. That takes several days; and then it may be kept in refrigeration at destination for from two to four or five days after its arrival. Of course meat, for instance, killed at these centers, like Chicago or Kansas City, and consumed in those cities, probably would not be under refrigeration more than a week at the longest, except in special cases where some trade desires it kept for several weeks, until it is what they call aged. A great deal of hotel trade require their meat held from three to five weeks, regularly.

Mr. HAUGEN. Do you consider meat kept in cold storage for six months as wholesome as that kept there for one week or ten days?

Dr. MELVIN. If it has been put in refrigeration in proper condition, and is kept under proper conditions, I should say it was.

Mr. HAUGEN. Do you concur in that, Dr. Wiley?

Dr. WILEY. I have not investigated that matter at all. I do not know anything about the facts of the case.

Mr. LIVINGSTON. The simple fact that meat or anything else after you take it out deteriorates very rapidly, shows it was deteriorated before it was taken out.

Mr. HAUGEN. Probably you did not understand my question, Dr. Wiley. I asked Dr. Melvin if he considered a meat kept in cold storage for six months as wholesome as that kept there only for a week or ten days?

Dr. WILEY. That is a question I would not like to answer, because we have not investigated that point.

Secretary WILSON. If you inquire into the cattle trade generally you find that in the fall of the year a great many farmers have what they call their grass-beef surplus stock, and one of the blessings of cold storage is that these articles can be bought because they can be taken care of in cold storage, and if there was no such market, I do not know just what would be done with that class of stock.

Mr. LIVINGSTON. It would be sold, and the wage earners and you and I would buy it and we would not have to pay 30 cents a pound for it. I can take your own statements and show that we are not making food enough in this country now to meet the demand. If every pound were sold the day it was killed, and every egg was sold the day it was laid, and every pound of butter sold the day it was made you would not supply the market.

Secretary WILSON. The point I am making is that in certain seasons of the year, in the fall, there is a very large number of farmers who will have grass beef that they will want to dispose of, because they have not the facilities for taking care of it.

Mr. LIVINGSTON. They sell it in very poor order, because they want to get rid of it.

Secretary WILSON. They want to get rid of it, and the fact that we have cold storage enables it to be kept. That is not saying anything about the abuses of cold storage at all; that is one of the benefits of cold storage.

Mr. LIVINGSTON. This is a privileged resolution, Mr. Chairman, and I will wait until the Secretary can get some information—he is getting it now, and I am very glad to know that he is—and as soon as he gets a sufficient amount of it to base some kind of action on, I am going to call it.

The CHAIRMAN. The committee will take action on it as soon as we have reached that point.

Mr. LIVINGSTON. I do not want to hurry the Secretary, though, in his investigation, or the chemist.

Mr. HAUGEN. Would this resolution, reported in the form it is introduced, be of any value? Should it not go more into detail as to the number of months or days products could be kept beyond the 40 days?

Secretary WILSON. We will go into it intelligently, so that the information we get will cover the subject as far as possible.

Mr. HAUGEN. According to this resolution you would not be required to go into detail.

Mr. LIVINGSTON. He says he will not be confined to the resolution, but will make his investigation broader and deeper; which I supposed he would do. Mr. Chairman, I thank you.

The CHAIRMAN. We are very glad to have had you here, and we are greatly obliged to Secretary Wilson, Dr. Melvin, and Dr. Wiley for their attendance.

(Thereupon, at 11.45 o'clock a. m., the subcommittee adjourned.)

COMMITTEE ON AGRICULTURE,
Wednesday, February 1, 1911.

The committee met at 10.30 a. m., Hon. Charles F. Scott (chairman), presiding.

The CHAIRMAN. The committee will come to order, and the clerk will call the roll. This meeting of the committee was called at the request of Mr. Cocks, of New York, for the purpose of hearing whatever statement he might wish to make, and also the statements of certain gentlemen whom he will introduce, in relation to the bill (H. R. 25333), commonly known as the highway commission bill, which is as follows:

[H. R. 25333, Sixty-first Congress, second session.]

A BILL To promote the improvement of public highways, used for interstate travel, military uses, and post-rural routes; to secure correlation and coordination of road work among the States and the subdivisions of the National Government, and authorizing the appointment of a National Commission on Highway Improvement.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That a Highway Commission is hereby created, to be composed of three commissioners, to be appointed as follows: The Director of the Office of Public Roads of the United States Department of Agriculture, the Chief of the United States Corps of Engineers, and the Fourth Assistant Postmaster General. The members of the said commission shall receive a sum, in addition to the regular salaries they receive as officers of the Government, sufficient to bring their annual compensation to five thousand dollars, such additional compensation to be paid from the appropriation hereinafter provided for the Office of Public Roads of the United States Department of Agriculture.

SEC. 2. That the commissioners, after they have been appointed and qualified, shall organize and elect a secretary, whose salary shall not exceed four thousand dollars, to be paid from the appropriation for the Office of Public Roads in the same manner as provided in section one.

SEC. 3. That it shall be the duty of the commission to plan a definite system of coordinated interstate highways, designed to meet the exigencies of agriculture, commerce, the postal service and national defense; and the commission is authorized to call upon the Director of the Office of Public Roads to supply data and cause all necessary surveys, estimates of cost, and maps to be made, and furnish all necessary stenographic and clerical assistance required, and the said Director of the Office of Public Roads is hereby authorized and required to furnish all such information and assistance, the expense of which is to be defrayed out of the appropriation hereinafter provided for said office. The commission is authorized to make such investigations as may be necessary in the United States and elsewhere to enable it to plan said interstate system of highways. The commission is further authorized to bring about as far as practicable uniform traffic and road regulation among the several States, and the uniform licensing of motor vehicles. In this work, the fullest consideration shall be given to the existing laws of the several States. The commission shall, as soon as practicable, report to Congress a feasible plan for uniform interstate registration of motor vehicles. The commission is hereby empowered to apply to the several departments of the Government and to receive from them such information as may be necessary in the performance of the duties devolving on the commission under this Act, and the heads of departments of the Government are hereby authorized and directed to supply such information on application by the commission, when not incompatible with the public interest; and the Post Office Department is especially authorized and directed to supply

from time to time on application by the commission, full information as to the condition of the highways over which postal rural routes pass.

SEC. 4. That all surveys, plans, specifications, estimates, collection of data, and investigative and clerical work shall be carried out under the direction of the Director of the Office of Public Roads of the United States Department of Agriculture and paid for out of the appropriation hereinafter provided for the Office of Public Roads, but all such work must be in accordance with the decision and approval of the commission.

SEC. 5. That the commission shall make an annual report to the President of the United States on the first day of November of its labors for the twelve months preceding, to be transmitted by the President to Congress, with such recommendations as he may see fit to make.

SEC. 6. That to carry out the purposes of this Act the sum of two hundred and fifty thousand dollars, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, in addition to the sum already appropriated for this office, the said sum to constitute an item in the appropriation for the Office of Public Roads of the United States Department of Agriculture.

SEC. 7. That the President of the United States shall appoint for a term of five years three citizens, one of whom may be an engineer, who shall serve without compensation and who shall constitute the advisory members of the commission hereby created, but who shall act only in an advisory capacity; except that these members, acting with the commission, shall, through the President of the United States, extend an invitation to the Dominion of Canada, Mexico, Guatemala, San Salvador, Costa Rica, Honduras, Nicaragua, and Panama to participate in a conference to be held in the city of Washington for the discussion of an international plan of highway improvement, with particular relation to coordination of any plan or plans that may be contemplated by the above-named countries as regards highway improvement; and that the work of the said commission shall contemplate the formation of an International Board of Highways.

SEC. 8. That all Acts of Congress or parts thereof not consistent with this Act are hereby repealed.

SEC. 9. That this Act shall take effect immediately.

Mr. COCKS. Mr. Chairman, I do not propose to take up any time myself in the discussion of this bill, for the reason that there will be opportunity for me to do so at any time, and I therefore propose to proceed at once with the hearing of the gentlemen who are here. I would like to introduce Mr. John Stewart, who will take charge of the hearing and introduce the other speakers.

The CHAIRMAN. Will you permit me to make the suggestion that, while we do not wish to place any unreasonable short limit on these statements, the time of the committee is limited this morning, and we would be glad if you would get through within an hour.

STATEMENT OF MR. JOHN A. STEWART, PRESIDENT OF THE INTERNATIONAL LEAGUE FOR HIGHWAY IMPROVEMENT.

Mr. STEWART. The House bill, No. 25333, is the result of conferences held several years ago in the State of Florida among men who were residing in St. Augustine during the winter, and at these conferences, which in no wise, directly or indirectly, represented any interest whatever except that of civic pride and patriotism, gentlemen were present to devise some means through which there might be effected a coordination of the plans of the various States with reference to highway improvement. Of course it needs no argument to prove that even under so beneficent a form of Government as ours it is in certain instances and in several directions unfortunate that we are not a unit but made up of many States, and that the diversity of our interests at times causes us, as citizens of the several States,

to do those things we should not do for the general interest, and to leave undone those things which are of importance to us as a nation. No question—no public question—comes home so intimately to the citizens of all the States as the question of highway improvement. It is within the memory of men who are alive to-day when intimacy and relationship among the people depended almost entirely upon travel to and fro upon the highways. It is almost within my memory, though not quite, when it was a matter of wonderment that the post rider could go from Washington to Baltimore by leaving Washington at 5 o'clock in the morning and reach Baltimore at 11 o'clock at night. It is also almost within my memory when on the much-traveled road this side of Providence men with teams, in the spring of the year, did charitable work in drawing heavy loads out of the muck, which at times came to the wheel tops and made the roads impassable.

New York, I believe, was the first State to accomplish, or rather, to begin the accomplishment of a work, in the preparation of which the citizens of that State had been engaged for many years, namely, the founding of highways made upon such a basis as would make possible the building of a comprehensive highway system with reference in the main to the exigencies of commerce, and not so much with reference to the exigencies of politics. We have paid several million dollars in the way of educating ourselves in methods of road building and road maintenance, which serves as an object lesson to the other States, and very distinctly an object lesson as to the need of the passage of such a bill as was introduced by Representative Cocks. For instance, over two years ago I had the pleasure to drive the Secretary of Agriculture, Mr. Wilson, over several hundred miles of our New York roads in an endeavor to bring to his attention some of the needs of the State with reference to agricultural development. I remember that in going south from Ithaca we passed over the State road toward the State of Pennsylvania, and from the State road on the New York side we crossed the line and came upon a road in Pennsylvania which was almost impassable. Now, at various points where the State of New York adjoins the States of Vermont, Massachusetts, Connecticut, Pennsylvania, and New Jersey, one may travel over a highway that has cost the State of New York thousands of dollars per mile and run plump, as it were, against a wall, from a macadamized road on the New York side to a dirt road that is absolutely impassable across the border, or vice versa. Now, that illustrates in a striking way the need of some fundamental influence that will bring about upon the part of the States the coordination of all road plans into what is, in reality, or would be, in reality, a great national system. Now, we are not here in any sense as approving of or as standing as sponsors for national appropriations for road building. That is a matter quite apart from the subject matter of this bill.

The CHAIRMAN. It is not the ultimate purpose, then, of the sponsors of this bill to bring forward measures in the future looking to the construction of public highways at Government expense?

Mr. STEWART. By no means, Mr. Chairman. In fact, I may say that our own committee and our own association, the International League of Highway Improvement, believe that this work should be undertaken solely by the States. But there are now 47 different systems of highway improvement which have absolutely no relationship

one to the other, and only the influence that can be exerted by the United States Government can bring all these different plans and systems into harmony and coordination. We believe that this bill, if the Congress of the United States were to see fit to make it a law, would bring about such a coordination as would make it possible, under State appropriations and by State work, together with the advice which the National Government could give, and which the Government, under the able direction of Dr. Page, does now give the States, to have inside of a quarter of a century a system of roads that would be absolutely coordinated and over which one might go from New York to New Orleans or from Boston to Chicago, and at the same time be well adapted to commercial and other purposes. In short, the road system of the United States would not be what it is to-day. I won't say that it is exactly a disgrace, but in many sections it is a disgrace. It is a system which is no system at all, and the roads are built without method or farseeing purpose. In some localities it is simply a question of a bare complying with the law and providing some path over which the farmers can take their produce to the nearest market.

In this bill we have tried to eliminate any matter which would give in the slightest degree encouragement to the idea that we are sponsor of a bill to appropriate Government funds for the building of roads. Now, as an exemplification of the purpose which we had originally in view, I will say that the State of New York has recently appropriated, or rather is about to appropriate, the sum of \$1,250,000 for building a highway, or rather for building such parts of the highway as are needed now to fill in the missing links from the city of New York to Rouses Point. The Government of the Dominion of Canada, in return for such improvements, is to build a highway from Montreal to Rouses Point. That will make a great international highway of 450 or 500 miles in length. I am told, too, apropos of that particular section of the bill, that the States of California, Oregon, and Washington are now attempting to bring about a coordination of their road plans, and it is the intention of those three States to build at once a highway from boundary to boundary along the coast. In general it may be said that possibly only a few of all the States in the Union are in a position to embark on such relatively extensive improvements as New York; or it may be that other matters are of such predominant importance that this particular kind of public improvement is not being carried on on the scale it should be in order to meet the exigencies of agriculture and commerce. We trust that a careful reading of this bill and consideration of the whole subject of highway improvement will lead you, Mr. Chairman and gentlemen of the committee, to the conclusion that this bill is a proper one to enact, in that it takes cognizance of instrumentalities which the Government has in its possession to-day. It in reality creates nothing new, except that it systematizes and brings under direct control a work that is being done disjointedly to-day. The appropriation which this bill carries is not in any considerable degree greater than that which the Government now provides.

The CHAIRMAN. You do not expect this appropriation to take the place of what is now appropriated by the Government for the office of public roads?

Mr. STEWART. This bill would bring within the purview of the commission the work which is now being done, except that it would amplify and extend it.

Mr. LAMB. You do not mean that it would supersede it?

Mr. STEWART. In a measure it would supersede it.

Mr. LAMB. I should think not.

Mr. STEWART. Dr. Page would be the dominant factor in this commission and in this work.

The CHAIRMAN. I think I can say for Dr. Page that we would get some very vigorous protests if, on account of the passage of this bill, he should lose his appropriation.

Mr. STEWART. On the contrary we are well aware of the magnificent work that Dr. Page is doing, and we believe that this bill will aid him very materially. I will ask Dr. Page, with your permission, to elucidate that.

Mr. STANLEY. The first paragraph of this bill provides, as I understand it, that this commission shall consist of the Director of the Office of Public Roads of the United States Department of Agriculture, the Chief of the United States Corps of Engineers, and the Fourth Assistant Postmaster General, and that they shall be paid \$5,000 per annum in addition to the salaries that they receive for their services as Director of the Office of Public Roads, Chief of Engineers, and Fourth Assistant Postmaster General, respectively.

Mr. STEWART. It brings the pay up to \$5,000.

Mr. STANLEY. They receive more than that now, do they not? Will they receive anything additional for this work?

Dr. PAGE. As I read it, it brings the salaries up to \$5,000.

Mr. STANLEY. They receive more than \$5,000—

Dr. PAGE. I think all except the Chief of the Corps of Engineers receive less.

The CHAIRMAN. The idea is that if any of these men is serving now for less than \$5,000 per annum, he shall be allowed out of the appropriation in this bill enough to make his salary \$5,000 per annum.

Mr. STANLEY. In the event this bill should pass no man now in office can accept that money, as I understand it. Would it not be an increase? How can you increase his salary while in office?

Mr. HAWLEY. That limitation applies only to the members of the House and Senate.

Mr. STANLEY. I did not know that you could increase the salaries of these persons while in office.

Mr. HAWLEY. That does not extend to bureau chiefs.

Mr. STANLEY. Is the Fourth Assistant Postmaster General in any way a member of the Cabinet?

The CHAIRMAN. His salary can be increased by an act of Congress.

STATEMENT OF DR. LOGAN W. PAGE, CHIEF OF THE OFFICE OF PUBLIC ROADS.

Dr. PAGE. Mr. Chairman and gentlemen of the committee, in anything I may say in regard to this bill I want it understood that I am speaking for myself and not for the Secretary of Agriculture in any way.

The movement for national aid in this country has been one of steady growth for the last 15 years, and to-day powerful organiza-

tions, such as the National Grange, are pledged to national aid. By that I mean the expenditure of Government money in the construction of roads. As I interpret this bill, it seems to me that it is as good a compromise measure as I have seen. It enables existing bureaus of the Government to gather together the necessary facts and figures to make a comprehensive estimate of the cost of one definite system of intercorrelated interstate trunk-line roads, and, in selecting these roads, they are to be considered from the standpoint of agriculture, commerce, the delivery of the mails, and the national defense. It is my belief that if such a system of roads were selected and an estimate made of the cost of constructing these roads, I think it would be a string of figures that would startle any Member of Congress. I think in that way that if Congress should at any time in the future want to consider the matter of national aid, they would have definite facts and figures, and would know exactly what they were going to do. Now, considering another phase of the matter, that of education and stimulating interest in road improvement, I think the bill would have a very good effect. The fact that the Government had selected a particular line of road as being most important would stimulate the State and county authorities to improve that road first. Now, I know from my own experience in building object-lesson roads about the country that when we select a particular road and superintend the construction of that road, we find that in a very large number of localities that this road is known as the Government road afterwards, and they look upon it as being a road of more importance than the average one. They are more likely to keep it in good repair, and that has been one of the most encouraging phases of the work of the Office of Public Roads. The work is started by the Government and the communities carry it on. That is the aim of the object-lesson roads, and I think the provision made in this bill would aid a great deal in that respect.

Mr. LEVER. This bill creates a commission and brings to your aid the Chief of the Corps of Engineers and the Fourth Assistant Postmaster General and devolves certain duties upon that commission. Could you not as well do the work if the authority were vested in you and your office as it would be done through this highway commission? What special need is there for the creation of this highway commission? It seems to me that this work might be done as well by your office if you had the authority to do it.

Dr. PAGE. As I interpret this bill, it does not affect the Public Roads Office in the slightest degree. The Public Roads Office does practically all of the work recommended by the commission, but in considering the matter of the delivery of the mails and the national defense, it would be very helpful to have the advice and assistance of the Chief of Engineers and the Fourth Assistant Postmaster General, but, as I see it, their position is only advisory.

Mr. HAUGEN. Can not their advice be had at the present time? Can you not call on the Fourth Assistant Postmaster General for information?

Dr. PAGE. Certainly; but it would not be as effective as it would be if directed by Congress.

Mr. STEWART. It has been stated by an officer of the War Department that the War Department was not fully equipped with knowledge of the highways of the country; was not fully equipped with

maps of the highways along which the defense of certain points in this country would have to be conducted, and that to-morrow, if war was to be declared, over four-fifths of our entire coast they would not know with reference to the positions of the roads—what roads to use or how to defend any particular locality to greatest advantage—and that this bill was of importance to the War Department in that it would be able to compare the maps and plans of defense much more comprehensively than it is able to do now. The same thing is true with reference to the Post Office Department. They are constantly extending the Rural Delivery Service. They have a provision that no such route shall be established in territory where the roads are not kept up to a certain relatively fair standard. The post-office authorities would be greatly benefited if they were able to bring about a systematizing of these various State plans. They would then be able to do comprehendingly what they do now, in a measure, in the dark.

Mr. LEVER. Would not the practical effect of this bill be this—that you would build up in the War Department a roads bureau and in the Post Office Department a roads bureau? Now, as to your statement that the War Department knows nothing about the road—that they have no maps and no data, etc.—the point in my mind is, Can not the Director of the Public Roads Office gather that data and put it in shape for the use of the War Department and the Post Office Department?

Mr. STEWART. It seems to me that that might very well be done. Of course, the ideal system would be with the Director of the Public Roads Office as head and chief of such department or such a division, and the others in an advisory capacity. That was the intention.

Mr. LEVER. That is very true, but it seems to me that unless the War Department and Post Office Department went to work to get some information their advice would not be worth much.

Mr. STEWART. Of course, it would be intended that they shall co-operate with the Director in carrying out the provisions of the bill. Of course, the work itself would be done by the Bureau of Roads, probably the entire detail work, so far as that is concerned, but with reference to the planning of the foundation upon which the systems could be coordinated there are the exigencies of war and the exigencies of the postal service to be considered.

Mr. HAUGEN. Could not that work be done as well by the Office of Public Roads?

Mr. STEWART. I think so, if the authority of the Director were to be extended; except that it would seem to me that some authority should be given to him to require the War Department and the Post Office Department to furnish such information as he might absolutely need.

Mr. LEVER. But suppose they do not have any information that is worth anything?

Mr. STEWART. They have considerable information.

The CHAIRMAN. This idea, it seems to me, must have been in the minds of those who included the Chief of Engineers and the Fourth Assistant Postmaster General in this commission; in laying out a system of interstate highways it will, of course, occur that there are many roads any one of which might be used as a main thoroughfare, and I imagine that the Chief of Engineers would be called upon to

give his opinion as to which one of these roads would most contribute to the defense of some important point; and the Fourth Assistant Postmaster General would be called upon to give his opinion as to which road would most facilitate the distribution of mail. They would not need to have any expert knowledge of the roads of the country, but they would simply need to know in the one case what important point there is in the neighborhood of the road where it might be necessary to concentrate troops, and in the other case they would require knowledge as to the distribution of mail. I merely offer that as a suggestion.

Mr. STEWART. That is a very comprehensive statement of the views of our committee.

Mr. HAWLEY. Is it the purpose of this bill to have the commission plan a general system of roads throughout the United States?

Mr. STEWART. It was the plan to have a commission to lay the foundation; that is, to have one plan; a system, say from Maine to California, and then along different parallels. Then there should be north and south roads. We want the survey merely as a basis of coordination of the plans of the different States, so that New York State in building its highways would take into consideration the ultimate extension of the highways in reaching, for instance, Chicago across the States of Pennsylvania, Ohio, Indiana, and Illinois. It is the further purpose to permit the proposed commission to bring to bear such influence as may be legitimate to have the several States and local organizations undertake the building of these roads. It was also thought by our association that such commission would invite the highway officers of the different States at different times to different places where there might be discussion of these matters of interrelated interests. It was our object to have one system of highways for the entire country, so that one State should work with reference to the work that is being done by other States in building roads. Very few of the States, in fact only two or three, have any carefully worked out plan of highway improvement.

The CHAIRMAN. Has the development of the automobile given any special vitality to this idea? There is an increasing tendency on the part of our people to use it on long excursions, and it would be to them an advantage to have a system of highways by which automobiles could travel between all the important cities of the land.

Mr. STEWART. I will say for the information of the committee that the International League has no interest, direct or indirect, in the automobile. For instance, my own personal interest was aroused with reference to the situation in our State in the so-called abandoned farm section. The chief cause of the abandoned farms has been the impassible condition of the highways in 29 counties. I am greatly interested in that matter of abandoned farms, and ours is an association that has taken cognizance of like conditions in other States. Personally I believe that every State should appropriate directly all the money it can possibly find to build road systems with reference to the needs of the farmer, because it is only by the building of such highways that it will ever be possible for us to reclaim our abandoned farms, utilize to the full our agricultural possibilities, and by that means force down the price of food, which under conditions like to-day's is bound to keep going up.

The CHAIRMAN. I did not mean to intimate that that was the motive behind the organization. I should regard it as entirely legitimate for anybody interested in automobiles to press a measure of this kind which contemplates an interstate system that would connect the chief cities of the country.

Mr. STEWART. We have also an association, of which Dr. Page is president, which has taken in all the good roads associations of every character—agricultural, commercial, and automobile—and everybody who is interested in good roads is interested in that association and in the general project.

Mr. BEALL. What is being done by your associations toward bringing these road conditions to the attention of the legislatures of the several States? Is not that the proper place to begin the work?

Mr. STEWART. I will say this: I was on the executive committee of the New York State Canal Improvement Association, and it took us 11 years to work the sentiment of the people up to the point where we could secure that improvement. We made a compact with the State Roads Association, of which Mr. Pierpont, of Utica, was president, that if his association would support the canal improvement we would support the roads improvement. It took 17 years to work the sentiment of the people up to the point where they were willing to issue bonds for \$50,000,000 to build the system of roads which we were undertaking. Mr. Thomson, of Pennsylvania, has spent years in working up the sentiment of the people of his State to a point where they will spend eight or nine million dollars in road improvement. But it is absolutely outside of the power and influence of any committee of men, who have to pay money out of their own pockets to meet the expenses of a work that confers a universal benefit, to undertake to bring to the attention of all the States the benefits of a system which would be national and not subdivided as it is to-day, into 47 different parts. Of course, the work Dr. Page is doing is of immeasurable benefit in bringing to the attention of the States and communities the work that should be done, but it is only some influence like that of the United States Government that can bring about an improvement which is more needed than any other improvement in this country to-day. And, while it will undoubtedly take 100 years, and perhaps longer, to bring about a universal system, yet if a beginning were made by Congress to-day, undoubtedly inside of a decade, or 20 years at the outside, we would have a system that would compare very favorably with the systems of Europe, which it has taken 2,000 years to develop.

Mr. BEALL. If the National Government should take over even a limited supervision of the road system, don't you think there would be a tendency on the part of the States to cease doing what they have been heretofore doing and rely upon the Federal Government? Has not that been the experience in everything?

Mr. STEWART. We have had no such difficulty under our State system, and there is no tendency on the part of the various localities to put on the shoulders of the State the work which they have done in the past. On the contrary, it has had the effect very decidedly to stimulate local enthusiasm in good roads.

Mr. BEALL. But if the United States Government should undertake this work, don't you think the energies of the people would be greatly lessened?

Mr. STEWART. I think, on the contrary, that inside of a month after Congress should place this bill upon the statute books there would be a strong influence at work in all the States for road improvement—

Mr. BEALL. Would you not expect that if Congress should adopt the principles embodied in this bill there would be immediately developed a plan for appropriations direct from the United States Treasury to build roads in the different States?

Mr. STEWART. I don't think there could be a greater demand for such improvement over the country at large than there is to-day. You have had introduced already in this session, and I know that you have had introduced at other sessions, bills that would bankrupt the United States Government in 24 hours if they were carried out in law. But I do not see why, if this should become a law, that condition would be intensified. On the contrary, I am of the opposite opinion; that is, that it would so stimulate work on the part of the States, or many of the States, as would bring to a successful climax the work of the various State associations.

Mr. STANLEY. This bill provides that it shall be the duty of the commission to plan a definite system of coordinated interstate highways. Now, in the event they should discharge that duty and a coordinated highway uniting the cities of New York and Philadelphia should be planned farther on down the coast as far as Charleston or somewhere else, and the Secretary of War, or the Chief of Engineers, of the War Department, and the Fourth Assistant Postmaster General, of the Post Office Department, should join with the Director of the Office of Public Roads in a recommendation to the President, stating to the President that this road which they had planned and drawn on paper would materially aid in the national defense and was very necessary in the expeditious distribution of troops in all that region, as might be shown by a careful survey and its relation to all the roads branching from it—now, in the face of a statement of that kind, would you feel like petitioning your Representative to support a bill carrying an appropriation by the National Government for the furtherance and building of such a road or to aid the various States in constructing it?

Mr. STEWART. Speaking as an individual, I do not think I should. I do not believe that the United States Government at this particular juncture, with so many other things to appropriate money for, is in a condition even to consider that project, except possibly under such limitations as would make it no national project whatever. I have heard it variously estimated at anywhere from two to five billion dollars the cost of building a road system in the United States, and I do not think that is an exaggeration.

Dr. PAGE. Taking 10 per cent of the mileage of the roads of the United States, and the average cost per mile would be \$10,000.

Mr. STANLEY. Now, what you propose under this bill is to enable skilled engineers, with the knowledge that the Post Office Department has with regard to the exigencies of the postal service, and with that of the War Department in regard to the exigencies of the national defence, to plan roads—say running across the continent, which would subserve all these purposes. Now, when you come to run that road across the continent, a portion of it would be through a mountainous section where the road could only be constructed at a great

expense, far greater than in other sections. For instance, over the plains the cost would be much less. Now, would the people in the State of Colorado be disposed to spend twenty-five or thirty thousand dollars per mile to build a national highway when that highway would benefit people of other States to the same extent? As I understand it, the work proposed would be national in its character—

Mr. BEALL. Are these two departments to be connected with this commission for the purpose of making it a national project?

Dr. PAGE. They would select the roads they need—the roads of greatest importance—say, for the delivery of mail—

Mr. STANLEY. Has this commission any authority to build roads?

Dr. PAGE. None whatever. As I understand it, the commission would call into consultation the various State authorities familiar with the conditions and needs of the agricultural and commercial interests and would use their best judgment in selecting the most serviceable roads for the people generally.

Mr. STANLEY. Would not that work of selecting the roads that would best subserve the national defence and the delivery of mail and considering the details of cost and all matters connected with the location of the roads entail an enormous amount of labor upon the commission, requiring infinite time and patience?

Mr. PAGE. It would require a good deal of time.

Mr. STANLEY. And considering the lines of road to extend across the continent would involve more time and labor?

Dr. PAGE. Yes, sir.

Mr. STANLEY. Do you think that the Fourth Assistant Postmaster General and the Chief of Engineers have an hour to spare for this work? Are they not two of the busiest men in Washington? I do not know of two men who have less time to give to such a matter to-day. I do not know especially as to the Chief of Engineers. He is a splendid gentleman whom I know. I have an acquaintance also with the Fourth Assistant Postmaster General, and I know that they are both very busy. I do not see how it would be possible to put this infinite amount of toil and labor upon them. It would have to be done by proxy. Why could you not take charge of this business and call for such information as you may need to do the work?

Dr. PAGE. That could be done.

STATEMENT OF HON. B. CAMERON, PRESIDENT OF THE FARMERS' NATIONAL CONGRESS.

Mr. CAMERON. To illustrate my ideas on this subject, I will say that I once read a book entitled "The Highways and By-ways of Great Britain, as Viewed from an Automobile." Having taken some of these trips myself, I was very glad to read it from another person's viewpoint. That led me to the inquiry, why should not modern America, with all of its boastfulness, have some good national roads as well as ancient Rome, because all of those roads in England, Scotland, and France are simply those old Roman roads being kept up to this day. Why should not the United States have national roads? You can never have any order, arrangement, system or method in road construction through the isolated efforts of the different individual States.

Mr. STANLEY. Do you believe that these national roads should be constructed by the National Government?

Mr. CAMERON. I will come to that later. Now, here is a State over here with one kind of road, and here is a State over there with another kind of road, and one back here with still another kind—all isolated, with no order, method or arrangement in common. So it seems to us that we might as least make a beginning by having some national surveys made, and then stop right there. That is all we are asking for in this bill, a national survey, but this must be done by the National Government. Now the plan was to adopt the best method of doing this work. We believe that the people most interested in this are the farmers, and that would bring in the Department of Agriculture; due regard must be had for carrying the mails over these roads, and that would bring in the Post Office Department, and considerations of national defense would bring in the War Department. We thought that they would work in harmony. We thought that they would help each other, and that it would be of assistance to Mr. Page to utilize the Army Corps of Engineers, but of course if he can accomplish the same thing by having all of it in his hands, there could be no objection. We would rather have a particular and uniform method, and we believe that this can be best accomplished by means of a national survey.

The CHAIRMAN. To get definitely your idea of a road survey, would you expect to have the roads actually surveyed so as to indicate the grades, or simply have maps made?

Mr. CAMERON. Only maps.

Now, you know the different States are interested in certain localities. It is only local, but the National Government can look at it for the good of all the country—from a broader standpoint—and for that reason these surveys should be made under national authority. There is this idea about it: Away back yonder, years ago, all that we had was dirt roads, and it was incorporated in the Constitution of the United States that the Government should build post roads. Since then the discovery of steam led, first, to the use of steamboats, and after awhile it was found that steam could be applied to traction, to wheels, and then we had railroads. Now, with reference to the advent of the automobile, with this national highway system, you could go anywhere in the United States in your machine. Our idea was that the States would coordinate in building these roads, but according to a uniform plan. Then you could have, say, not less than five or six roads across the continent, from ocean to ocean, with several longitudinal roads, one along the Atlantic coast, one along the Pacific coast, one on each side of the Mississippi, one on each side of the Appalachian Chain, and one on each side of the Rocky Mountains. There you would have the plan, order, arrangement, and method of a national system with which all the States would coordinate. Then, I think further, that it could be arranged to connect the capitals of the States—connect capital with capital—until we had roads between all the capitals of the States.

The building is to be done by the States; all that we ask in this bill is that some plan or method be provided for doing a work, with which we are now simply groping in the dark. This is my interest in the bill, for the creation of an Interstate Highway Commission. Now, I belong to another order, the Farmers' National Con-

gress, that Mr. Stewart referred to in introducing me, and that organization, the Farmers' National Congress, believes that the National Government, the States, the counties, the townships, and the individual should all help to build roads. That is the position that organization took in its national congress.

The CHAIRMAN. What part of the work do they expect the National Government to do?

Mr. CAMERON. The chief thing is the survey, the laying out, the plan, and the arrangement, and for every dollar that the State expends on its roads, we feel that the Government should pay a proportionate part.

The CHAIRMAN. Why?

Mr. CAMERON. Because the Government gets the benefit of it.

The CHAIRMAN. It is perfectly obvious, of course, that the conditions under which the roads you referred to were built, when Rome was dominating all those countries, were so entirely different from those prevailing here that no sort of analogy can be drawn between them so far as the building of roads is concerned. It was necessary for the Romans to build those roads because that was the only way by which their troops could be moved. The conditions here are different, because it is inconceivable that troops will ever be transferred long distances overland in our country. It is equally inconceivable that the mails of the United States will be transported any considerable distance overland, except by rail. The rural route system or the star route system is the natural limit of such means of transportation. Therefore, it would seem as though it might be strongly urged that the Government, as an entity, has no interest in the construction of interstate roads, because the Government as an organization or entity would never use these roads. The people will use them, but they are citizens of the States. The Government, however, as a political entity, would never have any use for interstate highways, and my purpose in asking the question was to get your opinion as to the interest of the Government, as a political organization, in the construction of interstate highways.

Mr. CAMERON. Well, sir, the idea is perhaps that they may never be used except in connection with the railroads. Then it would be necessary to have them. That was found necessary in the Confederate War, when the armies moved where there were no railroads, and you do not know what time you may need them again.

Mr. STANLEY. They had very few railroads then.

Mr. CAMERON. Very few.

Mr. COLE. My plan would be to build roads in sparsely settled communities.

In traveling over the old National Turnpike, which extends from Washington into the State of Ohio, through Cumberland Gap and Hagerstown, I found the road in very bad condition. As I understand it, the National Turnpike was turned over to the States, and some of those counties would not sell for enough to build one good pike.

Mr. CAMERON. The only way, I think, is to hold it in the National Government; let it be done by cooperation.

Mr. COLE. Is it your theory that the counties should construct the roads?

Mr. CAMERON. I say they should build the roads under the survey made by the Government.

Mr. COLE. But these counties could not build a road.

Mr. CAMERON. Of course where they can not or do not—but this is a start in the right direction, and it is the only thing we can do.

The CHAIRMAN. As a matter of fact, your idea is that the passage of this bill would open the way for the Government to share in the cost of road construction, is it not?

Mr. CAMERON. I do not think that is contemplated by any of the gentlemen connected with the International Roads Association. I do, because I am a member of the Farmer's National Congress, and we believe that the Government, the States, the counties, townships, and individuals should cooperate in this work.

The CHAIRMAN. I have discovered in talking with the farmers of my State in regard to the construction of a road from Kansas City south that the farmers living along the road are opposed to it simply because they regard it as an automobile race track, and think it would be a detriment to them rather than an advantage.

Mr. CAMERON. I do not feel the aversion toward automobiles that some people do, because I find that wherever the automobile goes we get improved roads, and this is, of course, for the benefit of the farmer. The farmer gets the benefit of this. I think that is a narrow, contracted idea in some particular localities. For instance, in talking to Mr. Page this morning about a visit he made to Mr. Edison—Mr. Edison has written me that he has invented a storage battery for use in an electric car that will supersede Mr. Rockefeller's gasoline, and if he has done that, I do not see why the farmers can not use electricity in handling their produce and carrying it to market, but without good roads they can not use that or anything else. Mr. Edison may carry it further, so that it can be hooked onto plows. So I believe the farmers to-day are commencing to depend upon electricity as much as anyone else, and upon automobiles also.

Mr. PRATT. What progress is being made with reference to the storage battery?

Mr. CAMERON. That is as far as I know. I just wrote him a letter and asked him what progress he was making; that before this bill was drawn I, in company with Mr. Stewart, consulted President Taft and Vice President Sherman on the desirability of having these national surveys, which struck them favorably, which fact encouraged us to hope that Mr. Cocks would be able to induce you to report this bill favorably and enact it into law.

Mr. COLE. Mr. Stewart stated that the tendency would be to reduce the price of farm products. Do you think the farmers will agree to tax themselves in order to decrease the price of farm products?

Mr. STEWART. In carrying out our plans in New York for the bond issue, we met with some opposition, and in an address to some of my farmer friends in Madison County, in reference to the taxation they would be compelled to pay on account of the bond issue—it had been figured as several hundred dollars per capita—I made this statement: That if they would vote for the \$50,000,000 of bonds, I, myself, individually, would enter into an agreement with the farmers in my locality to pay the increased tax.

Now, reference had been made to the building of connecting links through poverty-stricken sections of the country, where enormous

cost would be entailed in the building of roads. The most difficult road project which this country has ever undertaken was that undertaken during the times of the Comstock Lode; that is, in the construction of a road through the Sierra Nevadas. That road cost in some places as high as \$250,000 per mile, and that road is still in existence. So far as carrying out the ultimate project is concerned, on the basis of the work we did in New York over a period of 17 years, it is expected by the projectors of this measure that undoubtedly it will take a century to carry out the ultimate plan which would be started by the passage of this bill. So far as that is concerned, we can only lay the foundation, and coming generations can enlarge upon it. I am not a Catholic, but I draw this inspiration from the Catholic Church—they eliminate time from the consideration of every one of their projects. They work to-day for that which they expect will advantage the church 150 or 250 years in the future. That, I believe, should be the thought and inspiration of every good American—that we do our work not with particular reference to to-day, but with reference to the future. Road improvement is a work that should be fostered by every man in all honorable and upright ways; and while we feel that the beneficent influence of such a project as ours could not be felt to-day or to-morrow, but that in years to come the country would reap the benefit of the work contemplated by this measure.

STATEMENT OF MR. J. A. COOK, OF MONTGOMERY, ALA.

Mr. Cook. Mr. Chairman and gentlemen of the committee, I am sorry that I am a very poor speaker, but I want first to call your attention to the decrease of population in our counties. You can take up the report of the last census and look all over it and you will find that nearly all of our counties, outside of the cities, have not increased in population during the last 10 years. That is true of Alabama, I know. I want to say to this committee that I was appointed, through the influence of my friend, Col. Stewart, as a representative from the United States at the Good Roads Congress at Brussels. I am sorry to say that the United States was the least in representation there and they had the least to say. Why? Because the United States Government has not made any appropriation, and we were simply honorary members that came there, but not as members of that congress. Now, while we were there, each of these other 26 governments, or most of them—there were 27 governments represented there—each of these 26 governments appropriates so much a year for the support of that congress, and they have something to say, while I did not have anything to say.

Fourteen years ago my county of Montgomery, Ala—Montgomery is the capital of the State—undertook to have a bond issue of half a million dollars to build roads, and the county board of revenue had to go to work and hire men to make speeches throughout the county in order to get the people to vote for it, because many of them thought it would ruin them in taxation. Well, we carried it by a small majority, but two years ago we made a bond issue of \$150,000, and we had only 41 votes against it in the whole county, so that you can imagine whether the farmers are against it or not, and our county has

run from twelve to thirty million dollars in taxation since we started to build good roads.

The CHAIRMAN. Mr. Cook, it does not relate directly to the matter under consideration, but this committee has been asked to consider the question of making an appropriation for participation in the next International Good Roads Congress. We would be glad if you would state briefly to the committee what, in your judgment, are the practical good results that might come to the United States from participation in such a congress.

Mr. COOK. Gentlemen, I think a great deal of good would come from it. I am a kind of combination man. I am something of a farmer; I am a member of the board of revenue and I am interested that far, and I am also a contractor, and I am going to say this to you. I learned a great deal about the building of roads and the maintenance of roads when I was abroad. I made my report to the Secretary of State, and I recommended an appropriation to send delegates to the next Good Roads Congress.

The CHAIRMAN. Were there any Americans there besides yourself?

Mr. COOK. Yes; Mr. Hill from New York was there, and then there were several States, which had highway commissioners, sent delegates there.

The CHAIRMAN. Did you all unite in a report to the Secretary of State?

Mr. COOK. Yes, sir; we did. We got up a petition there, and we all signed it, to the Secretary of State to make this appropriation, to report—

The CHAIRMAN. I did not refer to that, particularly, but I meant to inquire whether you, in conjunction with all the other delegates from the United States, made a report to the Secretary of State touching the proceedings of the congress, and the good results that you thought would follow from it?

Mr. COOK. No, sir; we did not, except in a petition gotten up in Brussels.

The CHAIRMAN. I assume that of course a petition would not contain any matter of any importance to us from the road-building standpoint.

Mr. COOK. No, sir; I made my report.

The CHAIRMAN. Did you make a written report?

Mr. COOK. Yes.

The CHAIRMAN. Has it been published?

Mr. COOK. Yes; I have about 15 or 20 copies down at my hotel.

The CHAIRMAN. Do you think that the matter contained in that report would be of advantage to everybody throughout the United States who is practically engaged in road building?

Mr. COOK. Yes; I do. You know, it makes a body of gentlemen go there who are representing the United States Government, which is said to be one of the wealthiest Governments in the world, and just sit up there and look like a block or something, and have nothing to say. It doesn't feel very good; it doesn't make a man feel that he is doing credit to the people he is representing, or a country like the United States, and I think the United States Government ought to be ashamed of itself not to contribute something. It cost me something like \$800 to go there, which I paid out of my own

pocket; and then to go there and stand up and look like a figurehead, I think it is a pretty bad proposition. [Laughter.]

The CHAIRMAN. Well, you are a good example of an American citizen yourself.

Mr. COOK. Yes; I am a good American citizen. So that I think that the United States Government ought to make provision as other countries are making provision and get representation in that congress. For every \$50 that is appropriated, that is paid in to the congress, we get one representative. There were 2,600 delegates there at that congress, and there were 27 different nations represented, so that you can just see the situation we were in—only about 16 of us, I think, from the United States.

The CHAIRMAN. The proceedings of the congress were, I assume, simply papers and discussions upon different methods of road building and road maintenance?

Mr. COOK. Yes; and street building and construction of sewers in cities.

The CHAIRMAN. Do you think that they can teach us anything of particular interest and importance which we do not know?

Mr. COOK. Well, yes, sir; they have a method of keeping up roads and building roads that we have not in this country. I myself went over a great many roads, as did the highway commissioner of Connecticut, Mr. McDonald. We spent a great deal of time on the roads observing how they kept them up and we took an interpreter along with us so that we could find out how they were doing it.

The CHAIRMAN. Do we not do the same work, where we do it at all, just as well?

Mr. COOK. No, sir; as a general thing we do not.

Mr. LAMB. Have you a copy of the proceedings of that congress?

Mr. COOK. Yes, sir; I have, at home; but they are very bungle-some; about so thick [indicating]; a good big body of different reports, you know, from different engineers from all over the world.

Mr. LAMB. Where can I procure a copy?

Mr. COOK. I think if you write to Mr. Powell, of New York, the publisher of the Good Roads Magazine, he may be able to get you a copy.

Mr. PAGE. I can supply you with copies that I have.

Mr. LAMB. Thank you.

ADDITIONAL STATEMENT OF MR. STEWART.

Mr. McLAUGHLIN. What is your idea, Mr. Stewart, in section 7, in having representatives from Canada, Mexico, Guatemala, and so on, to meet in conference?

Mr. STEWART. I will say this, that the same principle of coordination that would apply to the various States would apply with equal but perhaps indirect force to our nearest neighbors. Now, we are trying to apply this principle of international coordination in New York State, or rather to make an exemplification of that particular section of our bill, by appropriating, as I said, \$1,250,000 for the building of connecting links in the construction of a continuous highway from New York City to Rouses Point on the

Dominion border, and the Dominion Government has approved of such a project, and has expressed its intention to build a highway of similar construction and width from Montreal to Rouses Point. That is a beginning of a work which, under any scheme of international intercourse, of reciprocal relationship, will of necessity have to be taken up either by the provincial governments, or ultimately by the Dominion Government, with reference to the construction of provincial roads. Their problems and ours are absolutely similar. We meet along a frontier of 2,000 miles, and so far as any line of demarcation that is visible to the eye is concerned, or any difference in language or habits or manners or customs, or likes or dislikes, we are absolutely the same.

Mr. McLAUGHLIN. We would not be interested in having these roads built in other countries for military purposes, nor for the transportation of the mails, nor for the transportation of agricultural products, would we?

Mr. STEWART. Not particularly, no; but so far as—

Mr. HAUGEN. This provision was not put in there in anticipation of the agreement with Canada for reciprocity?

Mr. STEWART. No, sir; that was put in there three years before the reciprocity matter was brought to a focus.

Mr. McLAUGHLIN. I have not heard you gentlemen say anything to indicate that the countries the names of which are given here are doing work from which we can learn methods of importance. All the names given are of countries in Europe.

Mr. STEWART. That is very true. That is put in there in anticipation of a time when our relationship socially, for instance, will be so intimate, particularly with Canada and Mexico, as to bring about of necessity an understanding.

Mr. McLAUGHLIN. What branch of the Government would be carrying on these social relations, the military, or the Post Office Department, or the Congress?

Mr. STEWART. No; but to-day 150,000 Americans are going into Canada each year, and nearly 100,000 Canadians are coming into America every year across the border. I have heard it estimated that nearly 5,000,000 Americans and Canadians are going backward and forward across the border, over roads, by wagon, rail, and automobile; and we think some time it will be very essential that there should be arrived at, between us and Canada in particular, an understanding with reference to the construction of roads. But that is purely anticipatory.

The CHAIRMAN. We would be glad, of course, to hear you at length, and also others you have here who would like to be heard, but this committee is likely to be called to the House any minute, and I think we will have to ask you to submit in writing anything more that you or other gentlemen would like to say.

Mr. STEWART. We would be glad of that privilege.

The CHAIRMAN. The hearing will be printed, and anything that may be furnished in the form of a written brief will receive the same consideration as if presented orally. We are very glad to have had you here, gentlemen.

Mr. STEWART. We thank you very much, Mr. Chairman and gentlemen.

Mr. CAMERON. Mr. Chairman, please allow me to disclaim any intention of discourtesy to the people of your State. I thought that was an individual idea.

The CHAIRMAN. That is all right. I understand it to be a pleasantry.

(At 12.10 o'clock p. m. the committee proceeded to business.)

STATEMENT OF W. D. FORBES, M. E., VICE PRESIDENT FOR CONNECTICUT INTERNATIONAL LEAGUE FOR HIGHWAY IMPROVEMENT.

Any collection of men working in harmony will, of course, accomplish much, but, in asking that House bill No. 25333 be approved, it is evident that instead of being merely a collection of men it would be a permanent and continuous organization, making a persistent and constant effort to lay out and continue a coordination of highways and roads throughout the various States. After my own experience in having been brought up on the Continent of Europe, where the system of roads is most carefully, thoroughly, and satisfactorily carried on, my own country has always presented in its roads the most unsatisfactory, and, I can say, a disgraceful showing and lack of forethought.

If time was to be disregarded, the gentlemen who are anxious to see the measure become a law would do all that is needed, but it is not a momentary or spasmodic effort to do something, but a desire to have an organization formed which has authority, and can, therefore, in many ways facilitate and expedite the betterment of roads throughout our country.

It is not the idea of the bill that the Government should supply means for building roads—that is left entirely to the States—but it is self-evident that energy and money can be wasted by parallel roads disconnected, and it is of the utmost importance that some preconceived plan should be carried out. A lighthouse is a capital thing to steer by, but it is a useless thing to read by. This bill would introduce a lighthouse—something to be steered by—and finally the haven reached.

In continental countries it might be supposed that the main highways would not coordinate between the various countries for military reasons, but this is not the fact. While the continent of Europe may be looked upon as the arena of conflict, conflicts are the exception, if the last century is taken as a sample, and the people of Europe are wise enough to so prepare their roads that in time of peace communication can be easily made by vehicles between countries, with the result that the whole surface of western Europe is a network of highways and by-ways of admirable surface, on which, surging back and forth like the blood in the human body, the whole life of the various countries is maintained.

It may be said that for interior transportation there would seem to be little or no military advantage in good roads, but the experience of military engineers would be of vast importance, and to have the engineering talent of the Army in consultation would be of the very greatest advantage. Those who are conversant with the present admirable work being carried on by Mr. Logan Waller Page, Director

of the United States Office of Public Roads, might think that no further effort should be made to pass a bill of the nature of the one mentioned, but the work of Director Page is in the detail of construction. The object of the bill is to provide a body who will not consider the detail work, but a general plan. The value of such a body can not be overestimated, and to have the experience of the Office of Public Roads to turn to must strike everyone as something of vast advantage. It must be known to all men of affairs that personality is always entering into the discussion of the direction of highways. Personal interest would perhaps be a better term to use than personality, but my idea is that the committee prayed for in the bill could settle definitely the question of road location far better than by leaving it entirely in the hands of those who naturally desire to have improvements rebound to their own local advantage.

The committee would also, in time, be able to arrive at a national licensing of mechanically moved vehicles. As time goes on these vehicles will be constantly augmenting in numbers and the present annoyance of State lines must, of course, be finally done away with. Automobiles have largely been, up to the present time, vehicles of pleasure. They will continue to be this, but be supplemented by commercial vehicles, and what might be termed purely pleasure vehicles will become means of transportation which will work to the great advantage of the citizens of our country in transporting rapidly and cheaply workmen from large cities to surrounding districts where pure air and quiet can be obtained, and this, of course, will augment the value of the outlying properties and in every way work to the advantage of the citizens of our country.

There is no thought on the part of those who framed the bill to directly aid automobile builders, but it must be plain to all thoughtful people that the growth of the bicycle and automobile has had a decidedly advantageous influence on road making, and it is self-evident that the value of property increases with means of reaching it. The Garden of Eden at the North Pole would hardly command commercial prices. It would seem to me that with a system of road planning, by such a committee as is proposed, it would finally be a direct saving to county, State, and central government.

The bill does not create offices to be filled by men who would command large salaries, nor does it make new positions for anyone, its main and predominating idea being to have an authorized committee which will be perpetual to carry on the work which is of the utmost importance to the country at large.

STATEMENT OF MR. D. B. ATHERTON, MEMBER OF THE COMMITTEE ON NATIONAL HIGHWAY IMPROVEMENT.

As a member of the committee on national highway improvement, I desire to say a few words in favor of the passage of H. R. bill No. 25338.

There is undoubtedly a woeful lack of system in highway improvement in this country. In the first place, comparatively speaking, there are very few miles of good roads in the United States, which is to our discredit and shame. What roads we have are of a patch-work variety. In the great State of Pennsylvania, which by the way is my home State, the highways, generally speaking, are a disgrace.

However, through the agitation and efforts of automobilists, the legislature of the State has at last been aroused and it has appropriated several millions of dollars out of the public treasury for the building of State roads, the State paying a certain proportion and the county paying its share; so that there is a prospect of having some decent roads in that State. Lackawanna, my home county, is at this time building a macadam road, its entire length about 30 miles, which connects with a similar road in Luzerne County. In this instance, the cost is divided between the county, the street railway company, and the borough and townships through which the road passes. As a matter of public policy, this country should at least make a beginning toward national highway improvement. The project should bear the stamp of national approval. The bill before your honorable committee is a step in that direction. A highway through any State that has been approved by a national commission as the most direct and best adapted for the needs of the national defense and commerce would increase the value of real estate, be it farm land or otherwise. Residents along the line of such highway would have a pride in improving and keeping it in constant repair, and the benefit to be derived in the transportation of merchandise and farm products would many times exceed the burden of taxation incident to building of the road. An incentive would thus be given the State legislatures to appropriate moneys from the public funds, which in my judgment would remove any possibility of the National Government ever being asked to appropriate money for highway improvement. It is my opinion that the passage of this bill by the present Congress would immediately stimulate the several States of the Union to a better understanding of the needs of this great country of ours in the way of better roads.

I have traveled from Maine to California and it has been my observation that wherever you find good roads you find a prosperous community. Wherever you find poor roads, you find evidence of decay, poverty, and abandoned farms. Therefore, why can not the National Government step in at this time and through some agency, be it a commission, such as is provided for in the bill referred to or the Good Roads Bureau, map out a complete system of highways, so that there will be coordination between States and a stimulus to build suitable highways and thus place our great Nation on a par with other nations of the world? I believe the present high cost of living is in a measure due to the abominable roads through the great farming districts of the country.

This is a question worthy of your most earnest consideration.

STATEMENT OF MR. W. B. THOMSON, DIVISION ENGINEER, PENNSYLVANIA RAILROAD.

While the subject has been very thoroughly covered by the gentlemen who have already spoken, the portion of it which appeals to me is the practical lack of coordinated road work, as is illustrated by the conditions existing in the States of New York and Pennsylvania. This condition appeals to me particularly because I live at Elmira, N. Y., which is very close to the Pennsylvania line, and am very familiar with the road conditions in both States.

New York State is building roads to the State line where it seems, in their best judgment, they are needed. Pennsylvania is doing the same on their side of the line, but as they do not seem to agree on the roads the conditions are far from ideal, to say the least of it.

The object of the bill, as I understand it, is to place in the hands of a national committee the necessary authority, so that in a condition of this sort the roads recommended by the national committee can be submitted to the two State commissions with a view to establishing uniformity. This, it seems to me, is very much to be desired, and will, I think, be attained by this bill.

I am not in favor of decreasing the power of the Director of the Office of Public Roads, and feel that the operation of this bill will tend to greatly increase his power and aid him materially by giving him the assistance of the Chief of the United States Corps of Engineers and the Fourth Assistant Postmaster General, who should both be consulted in any movement of this kind that is contemplated.

I feel that the bill should be passed and that it will be a very decided step in the direction of a comprehensive system of roads for the entire United States.

At 12.10 o'clock the committee proceeded to the consideration of House joint resolution No. 262, as follows:

JOINT RESOLUTION Authorizing the President of the United States to invite the International Commission of Agricultural Education to hold the Third International Congress of Agricultural Education in the United States of America in the year nineteen hundred and twelve.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, authorized to invite the International Commission of Agricultural Education to hold the Third International Congress of Agricultural Education, in cooperation with the Department of Agriculture and the Association of American Agricultural Colleges and Experiment Stations, in the city of Washington, District of Columbia, during the year nineteen hundred and twelve, in commemoration of the passage of the Acts of Congress of eighteen hundred and sixty-two and eighteen hundred and eighty-seven establishing the Department of Agriculture and endowing the agricultural colleges and experiment stations.

The CHAIRMAN. Members of the committee will recall that at our last meeting we had under consideration a resolution which had been introduced, authorizing the President of the United States to extend an invitation to the International Commission of Agricultural Education to hold its Third International Congress of Agricultural Education in the United States, and in the absence of definite information they came to no decision upon it. Dr. True, of the Office of Experiment Stations, and Dr. Thompson, of Ohio, representing the Association of American Agricultural Colleges and Experiment Stations, are here this morning, and can probably give us the information that we desire.

STATEMENT OF W. O. THOMPSON, PRESIDENT OF THE OHIO STATE UNIVERSITY.

The CHAIRMAN. Dr. Thompson, in order that you may address your remarks exactly to the point we have in mind, I would like to suggest that you tell us who constitute the International Congress of Agricultural Education, how it is composed, just what its purpose is, just what practical benefit you expect to gain from its session in

this country, and about what obligations the Government of the United States would assume in tendering to that congress an invitation to meet here.

Mr. THOMPSON. A number of those questions, Mr. Chairman, are in the hands of Dr. True, and if you want them answered first, I will ask him to speak first. It was thought that perhaps I ought to say something just at the opening and then he would follow.

The CHAIRMAN. Take your own course; it does not matter to the committee who gives us the facts.

Mr. THOMPSON. First of all, we want to express our appreciation of the attitude of the committee on the other matters which have been before them, in which we were interested, for which we have had no other opportunity to express our appreciation and thanks. The holding of this International Congress of Agricultural Education in the United States in 1912 concerns us primarily for this reason, that 1912 is the fiftieth anniversary of the passing of the Morrill Act, the twenty-fifth anniversary of the passing of the Hatch Act, and marks the half century since the organization of the Department of Agriculture. It happens that this International Congress of Agriculture would come to the United States at that time. We thought it a happy circumstance to have all these combined in one great movement that should set out to the entire world the dignity and importance of this work in which we are engaged. Now, it happens that the Federal Government is giving about three and a half millions a year to the agricultural colleges and experiment stations, and ten or twelve millions to the Department of Agriculture; say fifteen millions annually. It happens also that this is, as we regard it, the most dignified, the most important, agricultural movement in the world. It is not to be compared to any other movement in its magnitude and importance. Time will not permit us here to say what we should like to say as to the importance of this movement, not only in the States but between the States, the spirit of unity and cooperation that is developed among the States in all part of our Union.

We believe that if there were at this time set out in a dignified way the history of this great movement as a sort of monument to the agricultural enterprise of the last half century, and if we were to do it in the presence of this International Congress of Agriculture, we should bring to the attention of the whole world the great importance of agricultural education as a great movement. We have now under the first and second Morrill Acts \$30,000, and next year will give \$50,000 to the agricultural colleges, and we are now giving \$15,000 and soon will give \$20,000 to each of the agricultural experiment stations, and we think that this sort of recognition of the passing of this legislation in the half century will be of great importance. We are so intensely interested in that matter that we are willing to beg of you gentlemen to give it favorable consideration.

The CHAIRMAN. Can you outline, roughly and briefly, the sort of program that you would expect to be presented at that meeting?

Mr. THOMPSON. It has been presented to the association, but I could not give it in detail; but it is this, in its essential features. First of all we wanted to go to work at it at once to collect from the stations and colleges and the Federal Government, in a compact and practicable form, the history of this movement, and publish it in a great memorial volume. We feel that we ought to get together

now some history of the agricultural education, and I want to say that that is a thing that will be permanent. Of course a convention passes, but the record of the convention, the great history of this movement remains, and that is one thing about it that appeals to all of us, that we ought to get this matter organized now. Everybody is asking, "What does agricultural education signify? What is it worth, anyhow? How much ought we to give to it? What are we going to do about it?" In Ohio now there are half a dozen bills presented to push agricultural education. Now, the question before the American people is soon going to be, What have we done with this education? Everywhere they are giving money, hand over fist, and legislators are falling over one another to give money for agricultural work, and judgment is going to be given on this work; and we feel that having had 50 years of collegiate history and 25 years of experimental history, it is time to get together a history of this great movement in which the Government has spent so much money.

The CHAIRMAN. That would be very impressive, if it were not for the fact that each one of these agricultural colleges and experiment stations has given an account of itself, year by year, as it went along, and it is because it has been able to give a good account of itself that the legislatures, as you say, are now falling over each other to give money for anything that has the word "agriculture" in it; so that the necessity, from a practical standpoint, of collating the work of the last 50 years does not seem to me so apparent.

Mr. THOMPSON. It is not so apparent at certain points; but there is not anywhere a monument that stands out to-day that brings that whole thing into a systematic, concrete, readable space, Mr. Chairman, and the very fact that such a great congress is held here in the city of Washington in the year 1912 would impress itself upon a great many people that do not know.

Now, I do not want to speak unkindly, but I beg to say that there are certain colleges and schools in this country that are as absolutely ignorant of agriculture, as a matter of education, as you and I are of Sanskrit. We have to force this thing to get it where it really applies.

The CHAIRMAN. You would expect, as the result of a work of this kind, that there should be some substantial support given to the cause of agricultural education throughout the country?

Mr. THOMPSON. No; I do not have the idea of support so much in mind as I have that of appreciation.

The CHAIRMAN. Is not the appreciation sufficiently indicated by the statement you have made of the willingness and eagerness of legislators to appropriate for agriculture?

Mr. THOMPSON. It would be in this committee, Mr. Chairman, and among intelligent gentlemen like yourselves; but we are not all so intelligent on these things as some of you are.

The CHAIRMAN. Pardon me for pressing the matter.

Mr. THOMPSON. Oh, yes; go right on.

The CHAIRMAN. But I want to develop your idea, that is all.

Mr. THOMPSON. Yes.

The CHAIRMAN. Is that the fact? Does not the fact that the support is so readily given show conclusively that the importance of the matter is impressed upon everybody?

Mr. THOMPSON. Most assuredly, among the people who have been doing the business. Now, there is no lack of appreciation in the minds of those connected with the colleges and experiment stations, but we are only a part of this country, although we think we are an important part; and now what we want is that this great movement shall be set before the world properly through this great educational congress, which will call the attention of the world to it. We think this a matter of extreme importance.

The CHAIRMAN. And yet is it not probable that the work of this congress would go to the very centers where you say that now the appreciation of this sort of thing is so well developed, namely, the agricultural colleges and experiment stations?

Mr. THOMPSON. In part, it would.

The CHAIRMAN. Do you expect to publish this book in a form that would send it by millions of copies into individual homes?

Mr. THOMPSON. No.

The CHAIRMAN. It is only, is it not, the men who are directly engaged now on work along some agricultural lines, who would be particularly interested in this world congress?

Mr. THOMPSON. It would, without doubt, go to all the libraries outside of agricultural sources, as a matter of valuable information. It ought not to be confined to agricultural communities. Of course it could not go, except as the press of the country would use that, to the county newspapers, and that sort of thing; but these things have a tremendous effect, and it is marvellous how far they do go into our American life; with increasing intelligence and increasing reading of the community, it is marvellous how far a thing like this reaches.

Now, the time is gone, gentlemen. I am not going to burden you with things I might say. I want to impress upon you this fact, that I am here because I am the chairman of the executive committee of the American Association of Agricultural Colleges and Experiment Stations and because that association, at two different annual conventions, has talked this matter up and passed a resolution and instructed us to urge it here, so that it is not a private enterprise that I am representing, by any means, but I hope you will understand that I represent the earnestness of that association in getting this thing before the world. I certainly would prefer not to come here, if I did not have to come as a matter of official duty, because I have other things to do; but I hope to impress upon you the earnestness of this movement in the minds of all these colleges and stations, and I hope it will have favorable attention. It is past 12 o'clock, and I know you are likely to be called away and your duty is perhaps elsewhere, but I hope that you will hear Dr. True.

STATEMENT OF MR. A. C. TRUE.

The CHAIRMAN. Dr. True, can you answer some of the questions I suggested in the beginning?

Mr. TRUE. Yes; I will try to do so. I may say that I am here primarily as the representative of the Secretary of Agriculture, rather than of the Association of American Agricultural Colleges and Experiment Stations, because this proposition is a proposition to hold this congress in commemoration of the organization of the Department of Agriculture. I have been designated to act with the associa-

tion as the representative of the Secretary in these matters. I have a somewhat different interest in the matter from that which President Thompson has set forth, because I believe that at this time a meeting of the kind which we have proposed would be of great benefit to the movement of agricultural education in this country. We are just beginning to spread out agricultural education from the higher institutions to the public schools, special agricultural schools, and our school system generally, and we have also inaugurated a great extension movement which is to reach the masses of our agricultural population, so that our system of agricultural education now is much broader and more far-reaching than it was even five years ago.

A great many problems are arising as to what shall be done along the different lines of this great effort. In Europe people have been working on these problems much longer than we have. Some of the countries have a much more elaborate system of agricultural education than we have at present, and have reached much more thoroughly than we have the masses of their people. Take such countries as France and Belgium, and Denmark, for example; they have had wonderful success in reaching the masses of their people, and they have elaborated methods which, for those countries, at any rate, have been very successful; so that from that standpoint, I think it is very important at this juncture, when there is so much popular interest in this great movement and yet so much misunderstanding of what it means, that we should bring together representatives from all countries, and especially from the European countries, and have a conference of this kind.

The importance of such a congress grows very rapidly out of the personal touch which men who come to it get, and I can illustrate that by my own experience in connection with this very matter. While I have not had the privilege of attending the two congresses of agricultural education which have been held abroad, I have been in the European countries and have come in personal touch with the leaders in agricultural education in a number of countries, and I find that when any question comes up here, the fact that I know the man who is working on the other side along similar lines, and that he understands something of what my problems are, enables me to get out of him much more than I can get in any other way, and so I think that the bringing over here of the leading representatives of the agricultural educational institutions in Europe and other countries, and having them come in touch with the representatives of the educational institutions of all our States, would be a very useful and important thing, and so, taking that in connection with the argument that President Thompson has advanced, and the fact that it is a great anniversary occasion, I think it would in many ways help the movement for agricultural education in this country. I can not see how it would otherwise be. Then we would have a permanent record which would enable very many who could not attend the conference to get the benefits in a permanent way of what the record is.

As regards the organization of the congress, at the Second International Congress of Agricultural Education, which was held in Liege, Belgium, in 1905, it was decided to effect a permanent organization, and so a commission was organized, and I have here the bulletin which sets forth the organization and membership of that

commission. That is in the French language. I have here a translation of the same, entitled "Regulations of the Permanent International Commission of Agricultural Education."

The CHAIRMAN. Can you not, without stopping to read the entire document, just state in a few sentences how the congress is constituted, who compose its membership, and how they are appointed?

Mr. TRUE. The international commission, which is the permanent body, consists of members and officers who were elected at the second international congress, and the list which I have here contains the names of representatives of the leading agricultural institutions in Europe. For instance, in Germany we have Prof. Backhaus.

The CHAIRMAN. Pardon me, but the personnel does not interest us particularly. What we want to know is how they are appointed, who designates them, and in what way it is done.

Mr. TRUE. The congress originally consisted particularly of delegates appointed by the various Governments and members who had paid the fees required.

The CHAIRMAN. And you expect, then, that any delegates to the congress from the United States would be appointed by the President or by the Congress of the United States?

Mr. TRUE. Yes; that they would be designated officially.

Mr. LEVER. That any delegates coming here from foreign countries would be entertained at the expense of the Government?

Mr. TRUE. Our idea was that the usual arrangement with reference to international congresses would prevail.

The CHAIRMAN. What is that arrangement?

Mr. TRUE. I understand that through the State Department a certain amount of entertainment is provided, but that the expenses of the delegates, of course, are paid by their own Governments.

Mr. LAMB. Were your expenses paid by the Government when you went over as a delegate, or did you go as a delegate?

Mr. TRUE. No; I did not. The United States has not had any official representative, so far, as I understand it.

The CHAIRMAN. Our information is that our experience with international congresses of various sorts which have met in this country has not been altogether happy. This Government does not seem to be organized very well to act as a host. The President has no contingent fund to draw from for the expense, he has no corps of aides whom he might designate as personal attendants to see that the visitors were properly taken care of, and we have been advised that a good deal of criticism has come from those who have been our guests in the past, in respect to these matters, and we have gotten very little practical good; and it was that information which made the committee hesitate to act favorably upon this resolution.

Mr. TRUE. As regards that, I understand that some of the international congresses, at least, have been very successful. For example, take the Congress of Fisheries, which was held here a few years ago. Of course criticisms might not come to my attention, but I am not aware of any criticism having been made, and I am sure that is regarded by those who had to do with the congress as a very successful affair. Criticisms did arise in connection with the tuberculosis congress, and I think those have been most prominent recently, but I understand that those grew out of the fact that the building in which the congress was held, which is the new building of the

National Museum, was not completed, as often happens in such cases, the rooms in which the congress was held were not in the best condition for such a meeting, there was more or less noise and confusion in the building, and the criticisms were directed to that.

I also understand from those who were intimately connected with this congress that the social arrangement, the entertainment part of it, was unusually satisfactory to the foreign delegates; that our State Department did everything that they could reasonably expect; that private parties assisted in a generous way toward their entertainment, and that they went away, so far as that is concerned, feeling very happy over the event.

The CHAIRMAN. I am sorry to have to interrupt you and bring this hearing to a close, but there is a call of the House and the members of the committee will be obliged to leave.

(At 12.20 o'clock p. m. the committee adjourned.)

(The copy of the regulations submitted by Dr. True is here printed in full, as follows:)

REGULATIONS OF THE PERMANENT INTERNATIONAL COMMISSION OF AGRICULTURAL EDUCATION.

ARTICLE 1. The Second International Congress of Agricultural Education creates a permanent commission of agricultural education.

ART. 2. The object of this commission is specially as follows: (a) To publish the resolutions of the international congresses with reference to agricultural education and to take the necessary steps to obtain their realization; (b) to provide for the organization of new international congresses and to contribute to their success; (c) to collect all documents relative to agricultural education; (d) to furnish information on these questions, etc.

ART. 3. The commission is composed of members representing the various nations, three members being chosen for each country. The officers of the commission are a president, three vice presidents, one secretary, one assistant secretary, and a treasurer. The commission is elected for the first time by the Second International Congress.

ART. 4. The commission is authorized to appoint honorary and corresponding members.

ART. 5. The officers represent the commission and see to the execution of its decisions. The officers also call meetings of the commission and attend to current business.

ART. 6. The commission is renewed to the extent of one-third of its members when the International Congresses on Agricultural Education convene, and such renewal is effected by the votes of the congress in session. The short terms of office are determined by lot. During the intervals between congresses the commission fills occurring vacancies by means of its officers.

ART. 7. The resources of the commission consist of individual contributions, subsidies, etc.

MEMBERS OF THE INTERNATIONAL COMMISSION.

[The members and the officers were elected by the Second International Congress, held at Liege, Belgium, in July, 1905.]

Germany.—Backhaus, professor of agriculture at the University of Königsberg; Wittmack, professor of Agricultural High School of Berlin; Wohltmann, professor in the Agronomic Institute of the University of Halle.

Austria.—Von Liebenberg, professor of the Agricultural High School of Vienna, and von Zimmerauer, councillor of the ministry of agriculture, of Vienna.

Belgium.—Hubert, director of the Agricultural Institute at Gembloux; Vliebergh, professor of the Agronomic Institute of the University of Louvain; Poskin, professor of the Agricultural Institute at Gembloux.

Spain.—J. M. de Ampuero, delegate of the agricultural societies of the Basque Provinces of Spain; Botija y Fajardo, director of the Agronomic Institute of Madrid.

United States.—A. C. True, Director of the office of Experiment Stations, United States Department of Agriculture, Washington, D. C.; W. H. Beal, delegate of the United States Department of Agriculture; L. H. Smith, professor and delegate of the University of Illinois.

France.—Grosjean, inspector general of agriculture in France; Ringelmann, professor of the Agronomic Institute of Paris; Wéry, vice director of the Agronomic Institute of Paris.

Great Britain.—Sir E. Clarke, former secretary of the Royal Agricultural Society of England; Théobald, professor of the Agricultural High School at Wye (University of London); Middleton, professor of the University of Cambridge.

Grand Duchy de Luxembourg.—Esschen, minister of state at Luxembourg; Klein, director of agriculture at Luxembourg; Pruem, deputy at Clervaux.

Holland.—Broeckema, director of the Agricultural High School at Wageningen; Lovinck, director general of agriculture in Holland; Van Hoeck, inspector of agricultural instruction in Holland.

Hungary.—De Vöröz, director of the Agricultural Academy at Magyar-Ovar; Alfred Krolopp, from the agricultural ministry at Budapest.

Mexico.—His Excellency Señor de la Barra, minister plenipotentiary and envoy extraordinary of Mexico at Brussels.

Portugal.—Count d'Azevedo de Sylva, minister of Portugal at Brussels; Cincinnato da Costa, professor of the Agronomic Institute of Lisbon; Luiz de Castro, deputy and professor at the Agronomic Institute of Lisbon.

Russia.—Basile Goriatchkine, professor of the Agricultural Academy of Moscow; Kablokoff, professor of the Agricultural Academy of Moscow; Schkatelof, professor and vice director of the Agricultural High School of New Alexandria, Russia.

Switzerland.—Bieler, director of the Cantonal School of Agriculture of Lausanne; de Vevey, delegate of the Agricultural Society of Italian Switzerland.

Sweden.—Flach, chief of bureau of the Swedish ministry of agriculture.

The president of the commission is Henri Delvaux, governor of the Province of Liege, Belgium.

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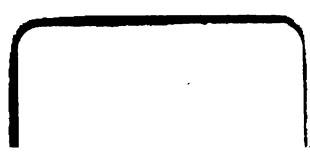
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